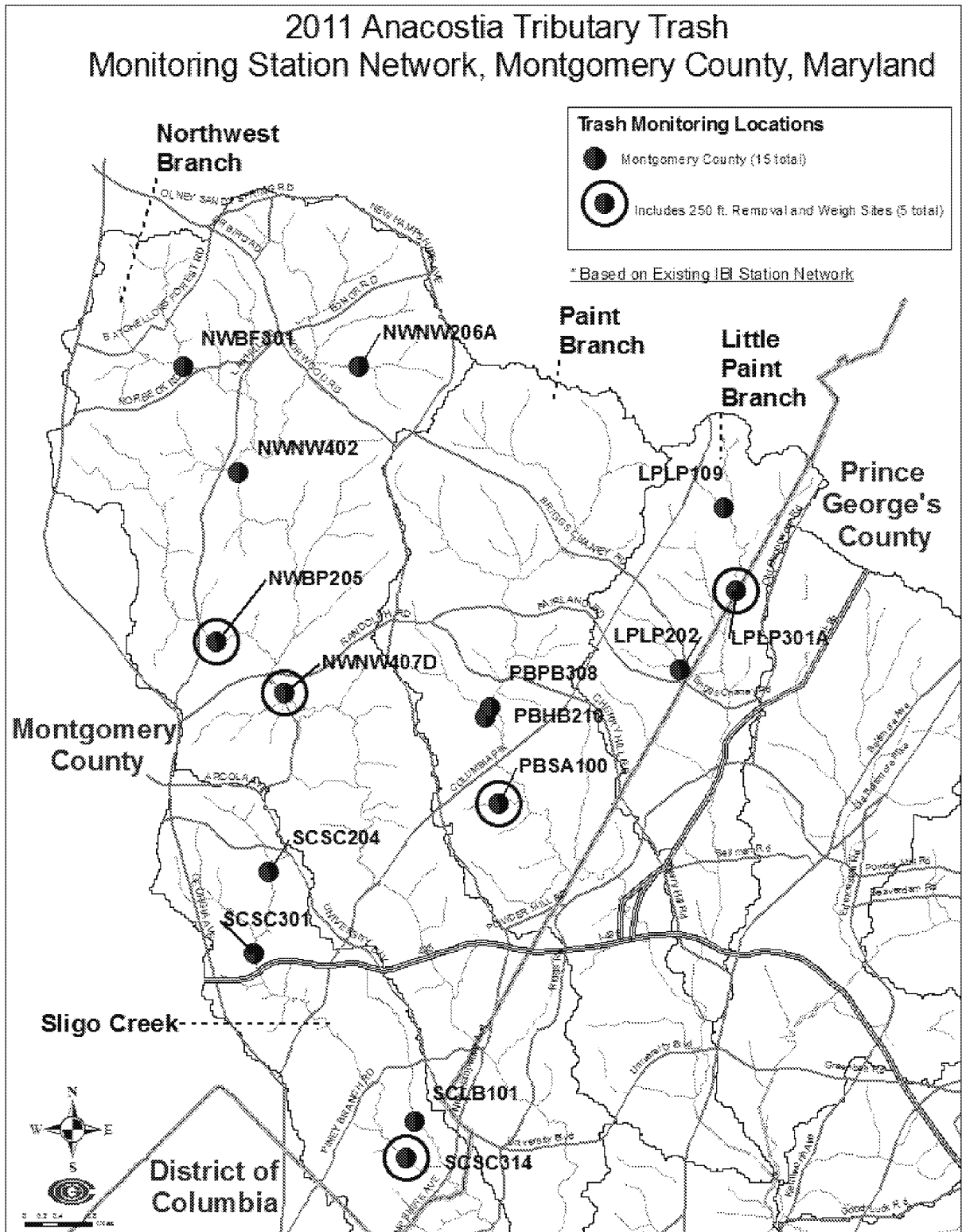


Montgomery County Trash TMDL Monitoring Update Summary



I. Sligo Creek Trash Sites**Site ID:** SCLB101 (Sligo Creek)**Station Name:** Long Branch**Trash Rating¹:** Moderate**Site ID:** SCSC204 (Sligo Creek)**Station Name:** University Blvd.**Trash Rating¹:** Very Light**Site ID:** SCSC301 (Sligo Creek)**Station Name:** Forest Glen Rd.**Trash Rating¹:** Very Light

Site ID: SCSC314 (Sligo Creek)	Station Name: Carroll Ave.	Trash Rating¹: Moderate
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II. Northwest Branch Trash Sites		
Site ID: NWBP205 (Northwest Branch)	Station Name: Bel Pre Creek	Trash Rating¹: Moderate



Site ID: NWNW206A (Northwest Branch)	Station Name: Nursery Run	Trash Rating¹: Very Light
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Site ID: NWBF301 (Northwest Branch)	Station Name: Batchellor's Run	Trash Rating¹: Light
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Site ID: NWNW402 (Northwest Branch)	Station Name: Layhill Park	Trash Rating¹: Very Light
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Site ID: NWNW407D (Northwest Branch)	Station Name: Kemp Mill Rd.	Trash Rating¹: Very Light
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III. Paint Branch Trash Sites

Site ID: PBSA100² (Paint Branch)

Station Name: Stewart April Ln.

Trash Rating¹: In Progress



Site ID: PBHB210 (Paint Branch)

Station Name: Hollywood Branch

Trash Rating¹: High



Site ID: PBPB308 (Paint Branch)

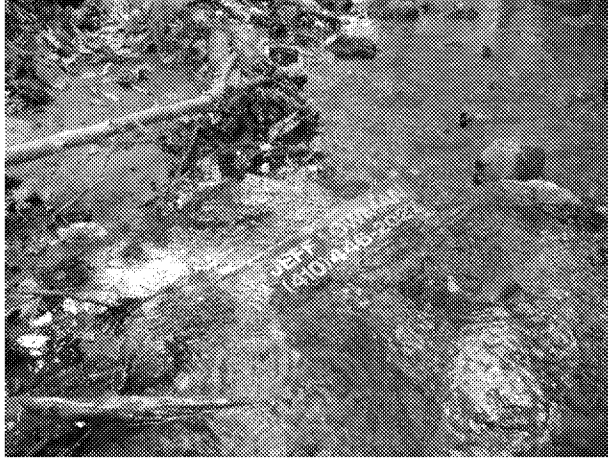
Station Name: Valley Mill Park

Trash Rating¹: Very Light



IV. Little Paint Branch Trash Sites

Site ID: LPLP109 (Little Paint Branch)	Station Name: Fairland Park (North)	Trash Rating¹: Moderate
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Site ID: LPLP202 (Little Paint Branch)	Station Name: Briggs Chaney Rd.	Trash Rating¹: Not surveyed due to high turbidity
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Site ID: LPLP301A (Little Paint Branch)	Station Name: Fairland Park (Central)	Trash Rating¹: Light
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¹=

No. of Items/100 ft	Verbal Ranking
0-10.0	None-Very Light
10.1-25.0	Light
25.1-50.0	Moderate
>= 50.1	High

²=COG generated site ID

Table 1 – Summary: COG Trash TMDL Monitoring for Montgomery County, 500 ft. Counts (August 2011)

Site ID	Site Name	Sub-Watershed	Length (ft)	Top 3 Items ¹ (Numbers)	Total Number of Items	Number of Items per 100 ft	Verbal Ranking ²
SCLB101	Long Branch	Sligo Creek	500	1,9,13a	180	36.0	Moderate
SCSC204	University Blvd	Sligo Creek	500	1,9,4	50	10.0	Very Light
SCSC301	Forest Glen Rd	Sligo Creek	500	1,13c,20	35	7.0	Very Light
SCSC314	Carroll Avenue	Sligo Creek	500	1,9,16	129	25.8	Moderate
NWBP205	Bel Pre Creek	Northwest Branch	500	1,2,9	139	27.8	Moderate
NWNW206A	Nursery Run	Northwest Branch	500	20,13c,16	13	2.6	Very Light
NWBF301	Batchellors Run	Northwest Branch	500	16,9,20	56	11.2	Light
NWNW402	Layhill Park	Northwest Branch	500	2,5,19	31	6.2	Very Light
NWNW407D	Kemp Mill Rd	Northwest Branch	500	1,2,4	31	6.2	Very Light
PBSA100*	Stewart April Ln	Paint Branch	500	Survey in progress			
PBHB210	Hollywood Branch	Paint Branch	500	1,9,5	389	77.8	High
PBPB308	Valley Mill Park	Paint Branch	500	1,13c,(9,16 Tied)	25	5.0	Very Light
LPLP109	Fairland Regional Park (north)	Little Paint Branch	500	1,9,2	191	38.2	Moderate
LPLP202	BriggsChaney Rd	Little Paint Branch	500	Not surveyed due to high turbidity			
LPLP301A	Fairland Regional Park (central)	Little Paint Branch	500	2,1,(9,13c,19 Tied)	64	12.8	Light

¹= Trash Item Key: 1 = Plastic bags; 2 = Plastic bottles; 3 = Glass; 4 = Aluminum Cans; 5 = Styrofoam cups, etc.; 6 = Paper; 7 = Cardboard; 8 = Cloth, Clothing, Carpeting; 9 = Food Packaging; 10 Auto: A. Oil containers, B. Oil filters, Antifreeze containers, D. Body parts large >1 ft², E. Body parts small <1 ft²; 11 = Car batteries; 12 = Tires; 13 = Construction Debris: A. Bricks, B. Concrete, C. Lumber, D. Misc. (drywall, etc.); 14 = Appliances; 15 = Wooden pallets; 16 = Metal; 17= Shopping Carts; 18 = Toiletries/Drug containers; 19 = Sports equipment/ Toys; 20 = Miscellaneous

²=

No. of Items/100 ft	Verbal Ranking
0-10.0	None-Very Light
10.1-25.0	Light
25.1-50.0	Moderate
>= 50.1	High

*=COG generated site ID

Table 2 – Summary: COG Trash TMDL Monitoring for Montgomery County 250 ft. Removal and Weights (August 2011)

Site ID	Site Name	Sub-Watershed	Length (ft)	Total Items	Total Weight (lbs)	Weight (lbs) per 100 ft
SCSC314	Carroll Avenue	Sligo Creek	250	45	5.2	2.1
NWBP205	Bel Pre Creek	Northwest Branch	250	73	32.4	13.0
NWNW407D	Kemp Mill Rd	Northwest Branch	250	19	11.9	4.8
PBSA100	Stewart April Ln	Paint Branch	250	638	48.9	19.6
LPLP301A	Fairland Regional Park (central)	Little Paint Branch	250	33	8.7	3.5

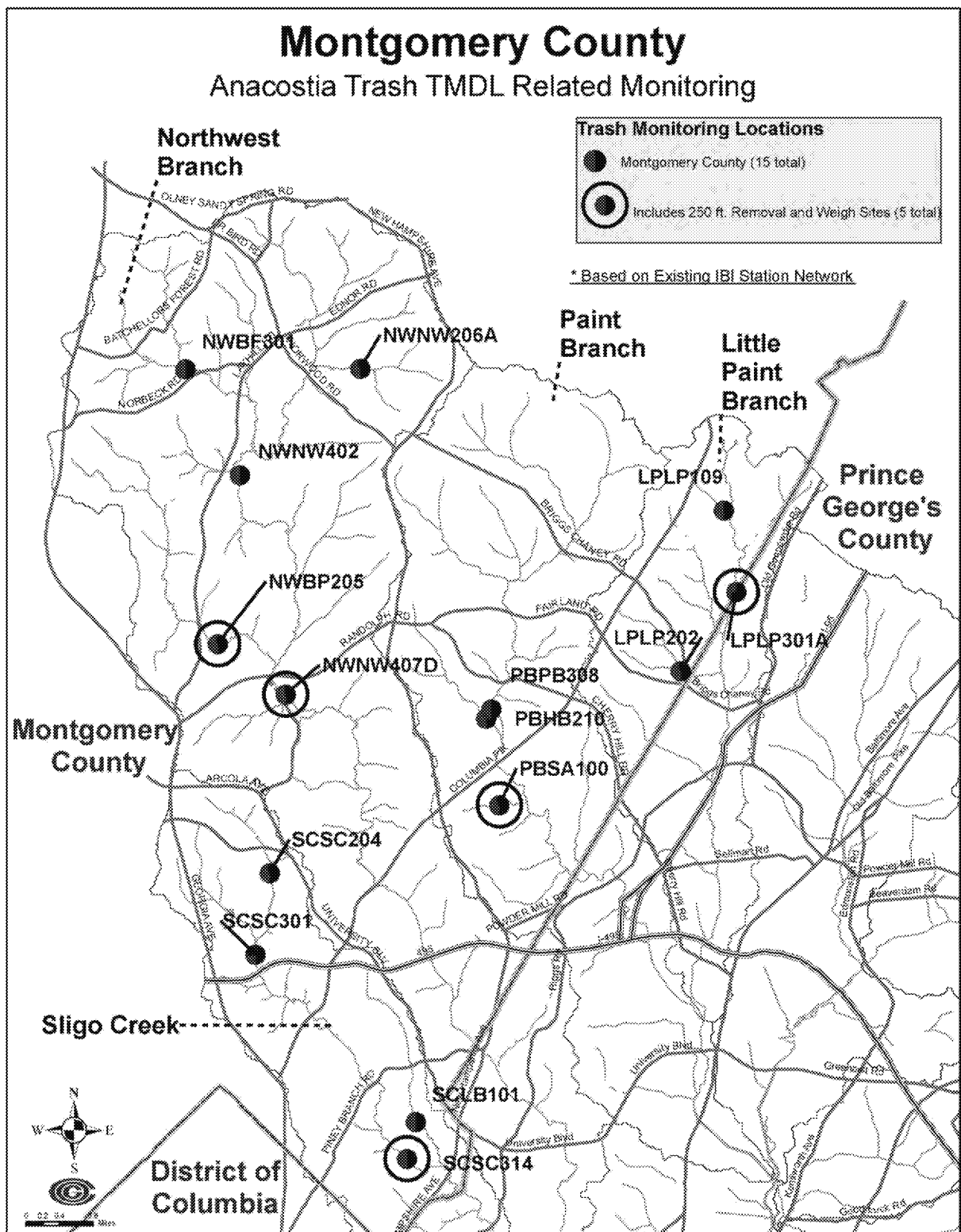
¹= Trash Item Key: 1 = Plastic bags; 2 = Plastic bottles; 3 = Glass; 4 = Aluminum Cans; 5 = Styrofoam cups, etc.; 6 = Paper; 7 = Cardboard; 8 = Cloth, Clothing, Carpeting; 9 = Food Packaging; 10 Auto: A. Oil containers, B. Oil filters, Antifreeze containers, D. Body parts large >1 ft², E. Body parts small <1 ft²; 11 = Car batteries; 12 = Tires; 13 = Construction Debris: A. Bricks, B. Concrete, C. Lumber, D. Misc. (drywall, etc.); 14 = Appliances; 15 = Wooden pallets; 16 = Metal; 17= Shopping Carts; 18 = Toiletries/Drug containers; 19 = Sports equipment/ Toys; 20 = Miscellaneous

²=

No. of Items/100 ft	Verbal Ranking
0-10.0	None-Very Light
10.1-25.0	Light
25.1-50.0	Moderate
>= 50.1	High

*=COG generated site ID

Montgomery County Trash TMDL Monitoring Update Summary
Fall Sampling Period (October 2011)



I. Sligo Creek Trash Sites

Site ID: SCLB101 (Sligo Creek)	Station Name: Long Branch	Trash Rating¹: Light
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Site ID: SCSC204
(Sligo Creek)

Station Name: University Blvd.

Trash Rating¹: Very Light



Site ID: SCSC301
(Sligo Creek)

Station Name: Forest Glen Rd.

Trash Rating¹: Very Light



Site ID: SCSC314 (Sligo Creek)	Station Name: Carroll Ave.	Trash Rating¹: Light
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II. Northwest Branch Trash Sites		
Site ID: NWBP205 (Northwest Branch)	Station Name: Bel Pre Creek	Trash Rating¹: Light



Site ID: NWNW206A (Northwest Branch)	Station Name: Nursery Run	Trash Rating¹: Very Light
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Site ID: NWBF301 (Northwest Branch)	Station Name: Batchellor's Run	Trash Rating¹: Very Light
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Site ID: NWNW402 (Northwest Branch)	Station Name: Layhill Park	Trash Rating¹: Very Light
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Site ID: NWNW407D (Northwest Branch)	Station Name: Kemp Mill Rd.	Trash Rating¹: Light
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III. Paint Branch Trash Sites

Site ID: PBSA100 ² (Paint Branch)	Station Name: Stewart April Ln.	Trash Rating¹: High
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Site ID: PBHB210 (Paint Branch)	Station Name: Hollywood Branch	Trash Rating¹: Moderate
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Site ID: PBPB308 (Paint Branch)	Station Name: Valley Mill Park	Trash Rating¹: Very Light
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IV. Little Paint Branch Trash Sites

Site ID: LPLP109 (Little Paint Branch)	Station Name: Fairland Park (North)	Trash Rating¹: Light
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Site ID: LPLP202 (Little Paint Branch)	Station Name: Briggs Chaney Rd.	Trash Rating¹: Very Light
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Site ID: LPLP301A (Little Paint Branch)	Station Name: Fairland Park (Central)	Trash Rating¹: Light
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¹ =	No. of Items/100 ft	Verbal Ranking
	0-10.0	None-Very Light
	10.1-25.0	Light
	25.1-50.0	Moderate
	>= 50.1	High

²=COG generated site ID

Table 1 – Summary: COG Trash TMDL Monitoring for Montgomery County, 500 ft. Counts (October 2011)

Site ID	Site Name	Sub-watershed	Length (ft)	Top 3 Items ¹ (Numbers)	Total Number of Items	Number of Items per 100 ft	Verbal Ranking ²
SCLB101	Long Branch	Sligo Creek	500	1,9,4	114	22.8	Light
SCSC204	University Blvd	Sligo Creek	500	1,9,2	45	9.0	Very Light
SCSC301	Forest Glen Rd	Sligo Creek	500	1,4,9	27	5.4	Very Light
SCSC314	Carroll Avenue	Sligo Creek	500	1,8,9	87	17.4	Light
NWBP205	Bel Pre Creek	Northwest Branch	500	1,2,4	67	13.4	Light
NWNW206A	Nursery Run	Northwest Branch	500	13c,5,16	16	3.2	Very Light
NWBF301	Batchellors Run	Northwest Branch	500	13a,16,(8,14,20 Tied)	42	8.4	Very Light
NWNW402	Layhill Park	Northwest Branch	500	1,8,20	12	2.4	Very Light
NWNW407D	Kemp Mill Rd	Northwest Branch	500	4,1,2	65	13.0	Light
PBSA100	Stewart April Ln	Paint Branch	500	1,2,9	403	80.6	High
PBHB210	Hollywood Branch	Paint Branch	500	1,2,9	186	37.2	Moderate
PBPB308	Valley Mill Park	Paint Branch	500	1,9,(2,4,8 Tied)	43	8.6	Very Light
LPLP109	Fairland Regional Park (north)	Little Paint Branch	500	1,9,2	106	21.2	Light
LPLP202	BriggsChaney Rd	Little Paint Branch	500	1,5,8	21	4.2	Very Light
LPLP301A	Fairland Regional Park (central)	Little Paint Branch	500	1,2,9	55	11.0	Light

¹= Trash Item Key: 1 = Plastic bags; 2 = Plastic bottles; 3 = Glass; 4 = Aluminum Cans; 5 = Styrofoam cups, etc.; 6 = Paper; 7 = Cardboard; 8 = Cloth, Clothing, Carpeting; 9 = Food Packaging; 10 Auto: A. Oil containers, B. Oil filters, Antifreeze containers, D. Body parts large >1 ft², E. Body parts small <1 ft²; 11 = Car batteries; 12 = Tires; 13 = Construction Debris: A. Bricks, B. Concrete, C. Lumber, D. Misc. (drywall, etc.); 14 = Appliances; 15 = Wooden pallets; 16 = Metal; 17= Shopping Carts; 18 = Toiletries/Drug containers; 19 = Sports equipment/ Toys; 20 = Miscellaneous

²=

No. of Items/100 ft	Verbal Ranking
0-10.0	None-Very Light
10.1-25.0	Light
25.1-50.0	Moderate
>= 50.1	High

*=COG generated site ID

Table 2 – Summary: COG Trash TMDL Monitoring for Montgomery County, 250 ft. Removal and Weights (October 2011)

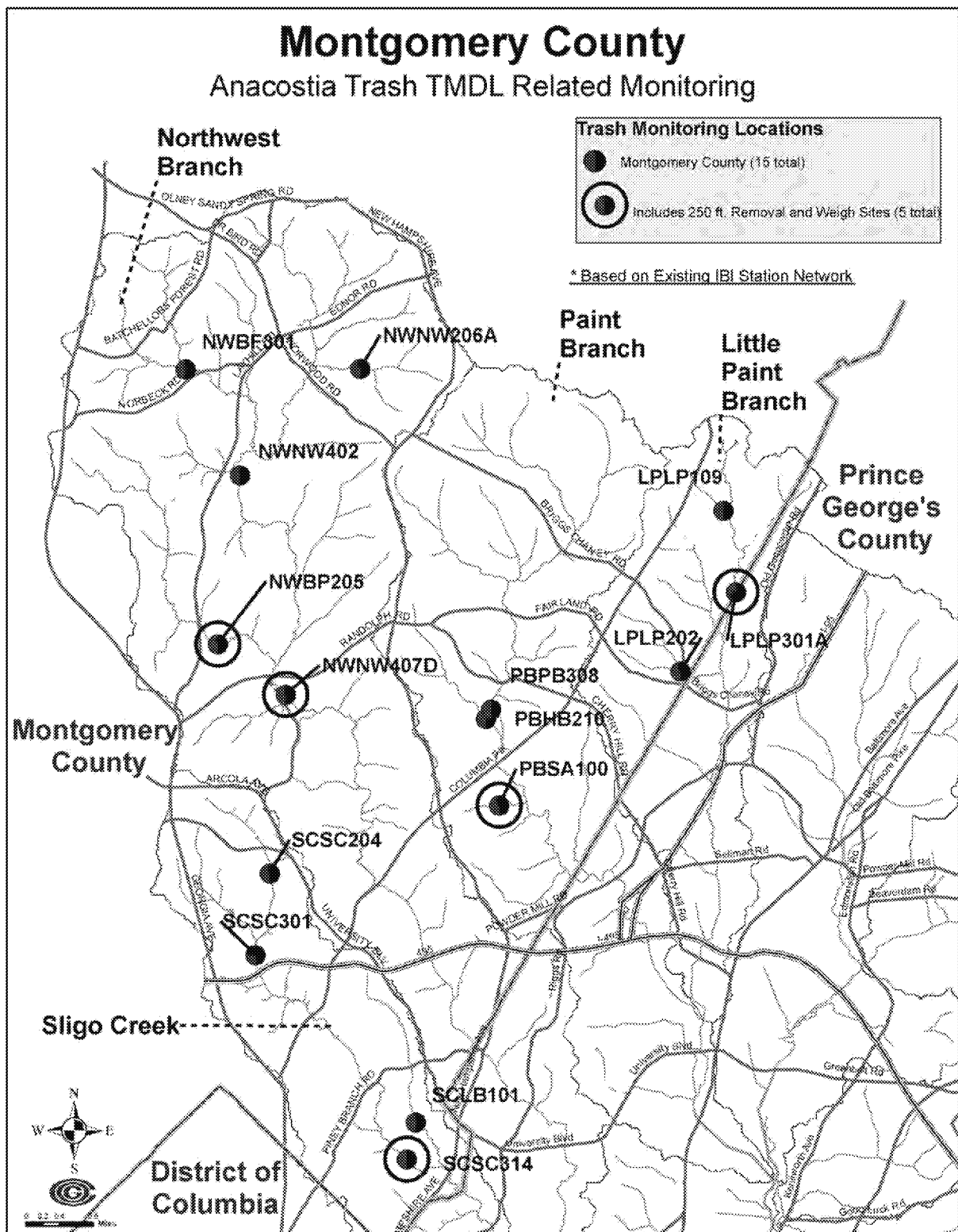
Site ID	Site Name	Sub-watershed	Length (ft)	Total Number of Items	Total Number of Plastic Bags/Pieces	Total Wet Weight of Plastic Bags/Pieces (lbs)	Total Weight (lbs)	Weight (lbs) per 100 ft
SCSC314	Carroll Avenue	Sligo Creek	250	20	9	3.3	9.8	3.9
NWBP205	Bel Pre Creek	Northwest Branch	250	26	12	1.1	3.2	1.3
NWNW407D	Kemp Mill Rd	Northwest Branch	250	30	8	0.3	3.6	1.4
PBSA100	Stewart April Ln	Paint Branch	250	186	88	6.4	13.2	5.3
LPLP301A	Fairland Regional Park (central)	Little Paint Branch	250	26	8	0.4	3.4	1.4

Table 3 – Approximate Monthly Trash Accumulations Rates (August to October)

Site ID	Site Name	Sub-watershed	Monthly Trash Accumulation (lbs per month)
SCSC314	Carroll Avenue	Sligo Creek	3.3
NWBP205	Bel Pre Creek	Northwest Branch	1.1
NWNW407D	Kemp Mill Rd	Northwest Branch	1.2
PBSA100	Stewart April Ln	Paint Branch	4.4
LPLP301A	Fairland Regional Park (central)	Little Paint Branch	1.1

Montgomery County Trash TMDL Monitoring Update Summary

Summer Sampling Period (July 2012)



I. Sligo Creek Trash Sites (July 2012)

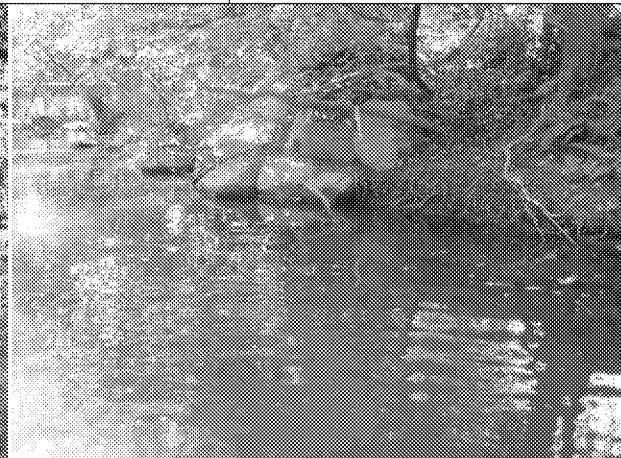
Site ID: SCLB101 (Sligo Creek)	Station Name: Long Branch	Trash Rating¹: Moderate
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Site ID: SCSC204 (Sligo Creek)	Station Name: University Blvd.	Trash Rating¹: Light
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Site ID: SCSC301 (Sligo Creek)	Station Name: Forest Glen Rd.	Trash Rating¹: Very Light
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Site ID: SCSC314 (Sligo Creek)	Station Name: Carroll Ave.	Trash Rating¹: Moderate
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II. Northwest Branch Trash Sites (July 2012)		
Site ID: NWBP205 (Northwest Branch)	Station Name: Bel Pre Creek	Trash Rating¹: Light



Site ID: NWNW206A (Northwest Branch)	Station Name: Nursery Run	Trash Rating¹: Very Light
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Site ID: NWBF301 (Northwest Branch)	Station Name: Batchellor's Run	Trash Rating¹: Moderate
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Site ID: NWNW402 (Northwest Branch)	Station Name: Layhill Park	Trash Rating¹: Very Light
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Site ID: NWNW407D (Northwest Branch)	Station Name: Kemp Mill Rd.	Trash Rating¹: Light
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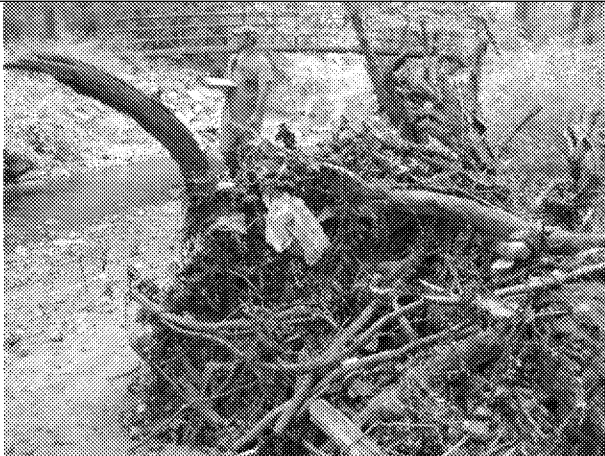


III. Paint Branch Trash Sites (July 2012)

Site ID: PBSA100 ² (Paint Branch)	Station Name: Stewart April Ln.	Trash Rating¹: High
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Site ID: PBHB210 (Paint Branch)	Station Name: Hollywood Branch	Trash Rating¹: Moderate
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Site ID: PBPB308 (Paint Branch)	Station Name: Valley Mill Park	Trash Rating¹: Light
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IV. Little Paint Branch Trash Sites (July 2012)

Site ID: LPLP109 (Little Paint Branch)	Station Name: Fairland Park (North)	Trash Rating¹: Light
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Site ID: LPLP202 (Little Paint Branch)	Station Name: Briggs Chaney Rd.	Trash Rating¹: Very Light
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Site ID: LPLP301A (Little Paint Branch)	Station Name: Fairland Park (Central)	Trash Rating¹: Very Light
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¹ =	No. of Items/100 ft	Verbal Ranking
	0-10.0	None-Very Light
	10.1-25.0	Light
	25.1-50.0	Moderate
	>= 50.1	High

²=COG generated site ID

Table 1 – Summary: COG Trash TMDL Monitoring for Montgomery County, 500 ft. Counts-July 2012, (N=15)

Site ID	Site Name	Sub-watershed	Length (ft)	Top 3 Items ¹ (Numbers)	Total Number of Items	Number of Items per 100 ft	Verbal Ranking ²
SCLB101	Long Branch	Sligo Creek	500	1,9,13a	140	28.0	Moderate
SCSC204	University Blvd	Sligo Creek	500	1,20,9	61	12.2	Light
SCSC301	Forest Glen Rd	Sligo Creek	500	1,9,6	45	9.0	Very Light
SCSC314	Carroll Avenue	Sligo Creek	500	1,9,2	176	35.2	Moderate
NWBP205	Bel Pre Creek	Northwest Branch	500	2,1,5	85	17.0	Light
NWNW206A	Nursery Run	Northwest Branch	500	13a,13c,(4,9,13d,16 Tied)	19	3.8	Very Light
NWBF301	Batchellors Run	Northwest Branch	500	13a,16,20	127	25.4	Moderate
NWNW402	Layhill Park	Northwest Branch	500	6,19,(8,20 Tied)	15	3.0	Very Light
NWNW407D	Kemp Mill Rd	Northwest Branch	500	2,1,13c	87	17.4	Light
PBSA100	Stewart April Ln	Paint Branch	500	1,9,2	1,206	241.2	High
PBHB210	Hollywood Branch	Paint Branch	500	1,9,2	241	48.2	Moderate
PBPB308	Valley Mill Park	Paint Branch	500	1,9,(2,5,20 Tied)	56	11.2	Light
LPLP109	Fairland Regional Park (north)	Little Paint Branch	500	1,2,9	119	23.8	Light
LPLP202	BriggsChaney Rd	Little Paint Branch	500	1,13c,(9,12 Tied)	30	6.0	Very Light
LPLP301A	Fairland Regional Park (central)	Little Paint Branch	500	1,9,(2,20 Tied)	43	8.6	Very Light

¹= Trash Item Key: 1 = Plastic bags; 2 = Plastic bottles; 3 = Glass; 4 = Aluminum Cans; 5 = Styrofoam cups, etc.; 6 = Paper; 7 = Cardboard; 8 = Cloth, Clothing, Carpeting; 9 = Food Packaging; 10 Auto: A. Oil containers, B. Oil filters, Antifreeze containers, D. Body parts large >1 ft², E. Body parts small <1 ft²; 11 = Car batteries; 12 = Tires; 13 = Construction Debris: A. Bricks, B. Concrete, C. Lumber, D. Misc. (drywall, etc.); 14 = Appliances; 15 = Wooden pallets; 16 = Metal; 17= Shopping Carts; 18 = Toiletries/Drug containers; 19 = Sports equipment/ Toys; 20 = Miscellaneous

²=

No. of Items/100 ft	Verbal Ranking
0-10.0	None-Very Light
10.1-25.0	Light
25.1-50.0	Moderate
>= 50.1	High

*=COG generated site ID

Table 2 – Summary: COG Trash TMDL Monitoring for Montgomery County, 250 ft. Removal and Weights-July 2012, (N=5)

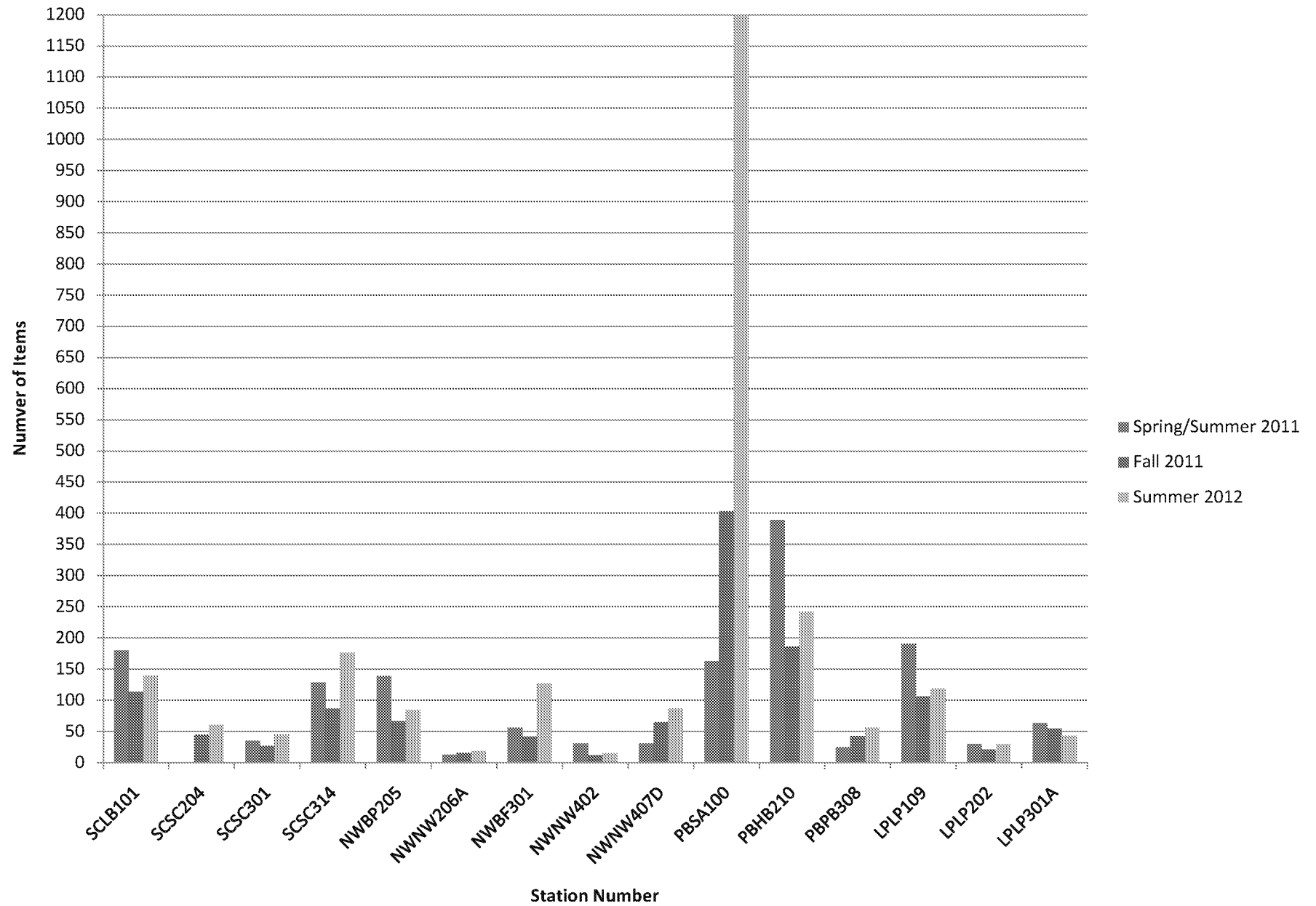
Site ID	Site Name	Sub-watershed	Length (ft)	Total Number of Items	Total Number of Plastic Bags/Pieces	Total Wet Weight of Plastic Bags/Pieces (lbs)	Total Weight (lbs)	Weight (lbs) per 100 ft
SCSC314	Carroll Avenue	Sligo Creek	250	120	40	3.9	10.1	4.0
NWBP205	Bel Pre Creek	Northwest Branch	250	49	11	6.6*	11.5	4.6
NWNW407D	Kemp Mill Rd	Northwest Branch	250	102	9	1.9	14.2	5.7
PBSA100	Stewart April Ln	Paint Branch	250	614	231	15.9	34.4	13.8
LPLP301A	Fairland Regional Park (central)	Little Paint Branch	250	14	3	0.3	1.5	0.6

*-Bags heavily contaminated with sandy material

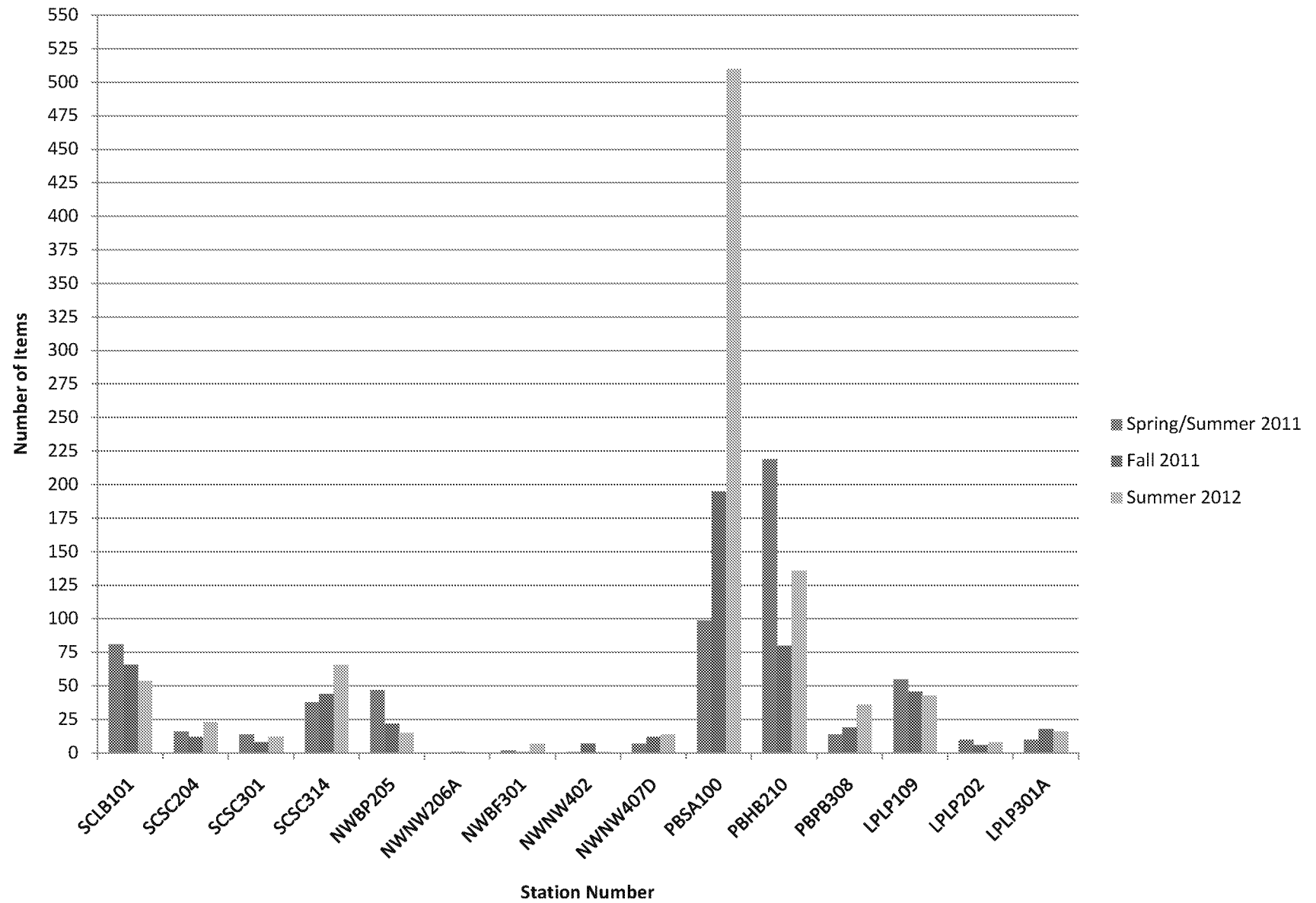
Table 3 – Approximate Monthly Trash Accumulation Rate-October 2011 to July 2012, (N=5)

Site ID	Site Name	Sub-watershed	Total Weight (lbs)	Accumulation Period (Months)	Monthly Trash Accumulation (lbs per Month)
SCSC314	Carroll Avenue	Sligo Creek	10.1	9	1.1
NWBP205	Bel Pre Creek	Northwest Branch	11.5		1.3
NWNW407D	Kemp Mill Rd	Northwest Branch	14.2		1.6
PBSA100	Stewart April Ln	Paint Branch	34.4		3.8
LPLP301A	Fairland Regional Park (central)	Little Paint Branch	1.5		0.2

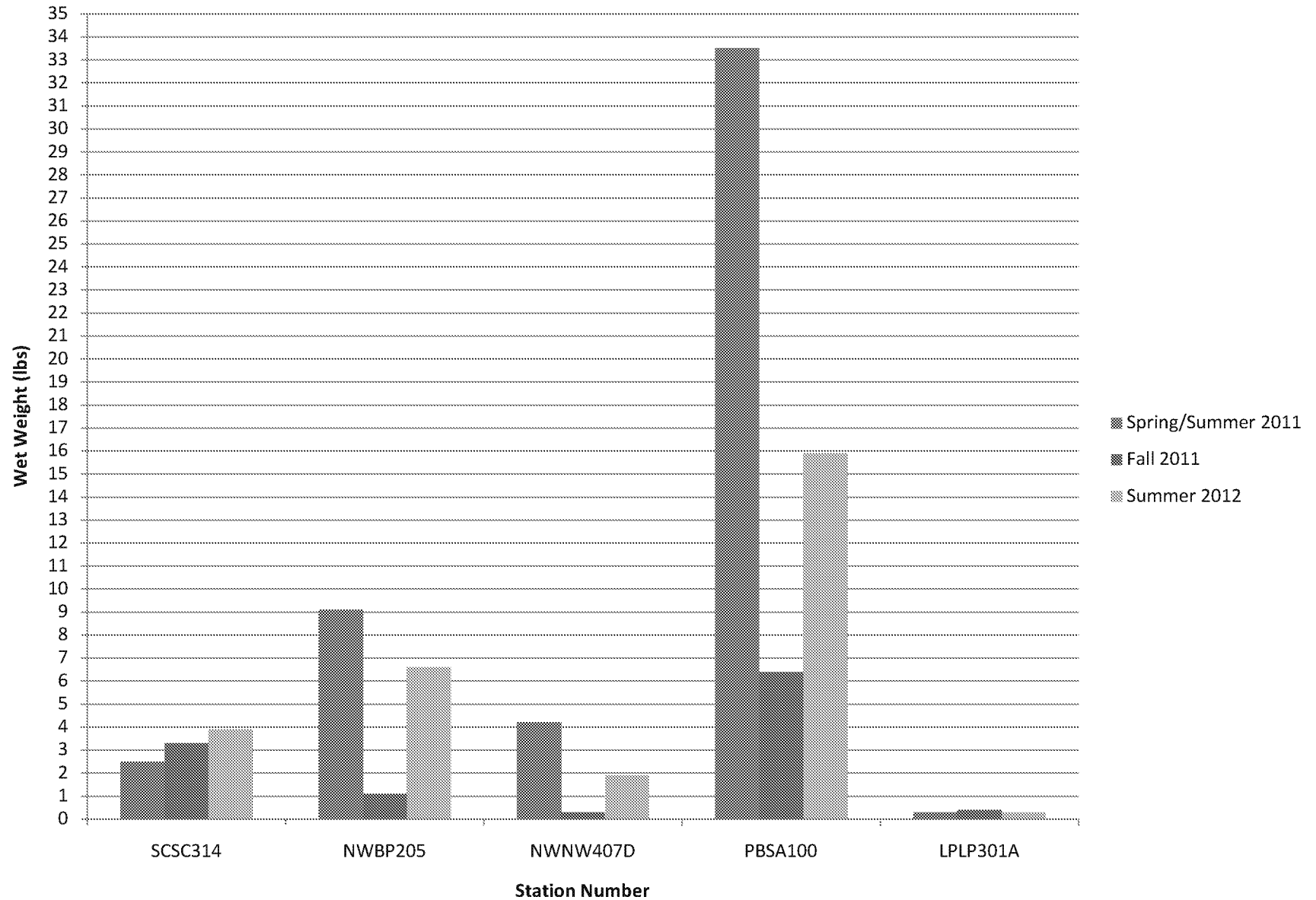
Summary: Total Number of Trash Items for 500 ft Count Sites, 2011-2012



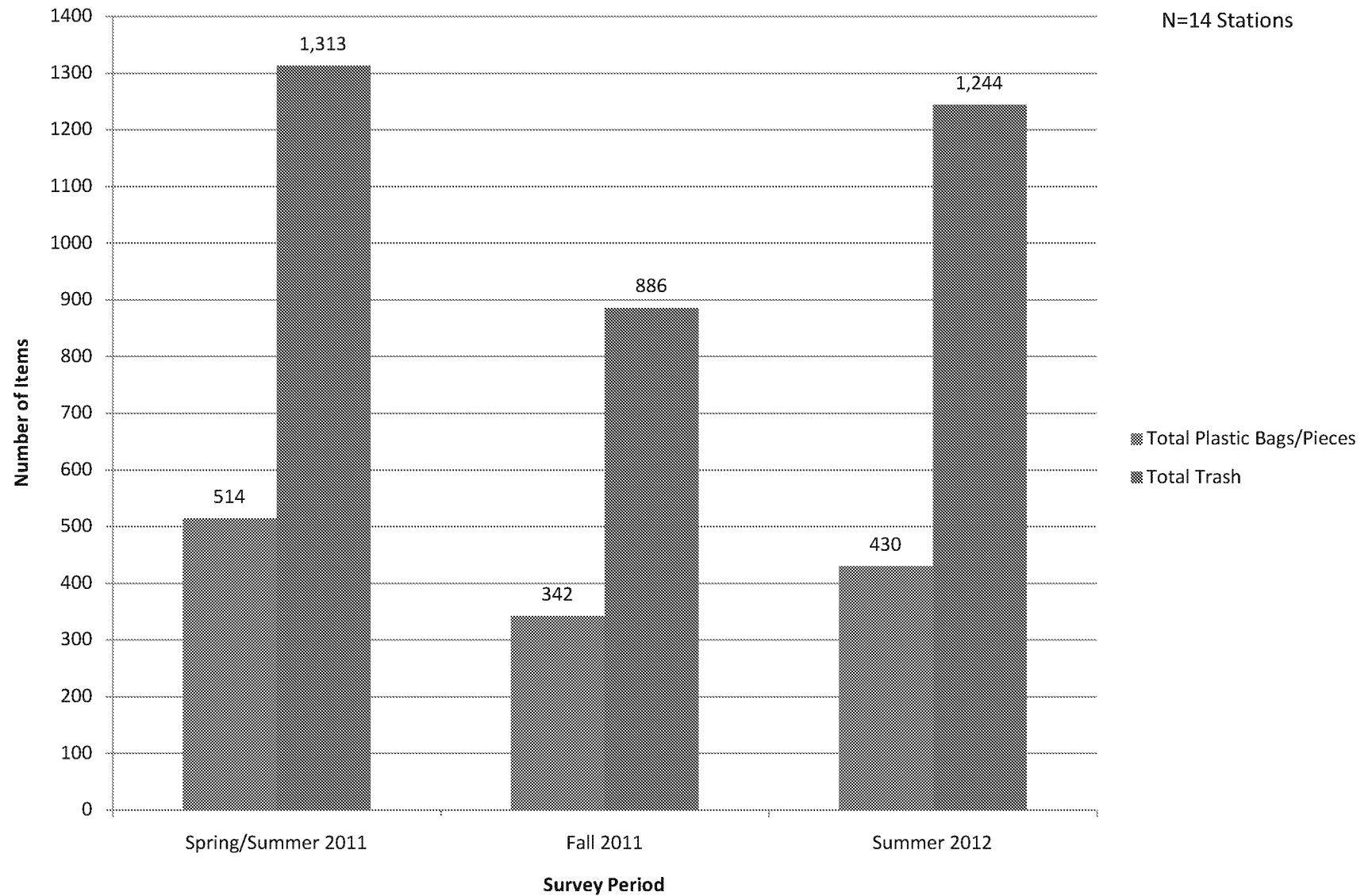
Summary: Total Number of Plastic Bags/Pieces for 500 ft Count Sites, 2011-2012



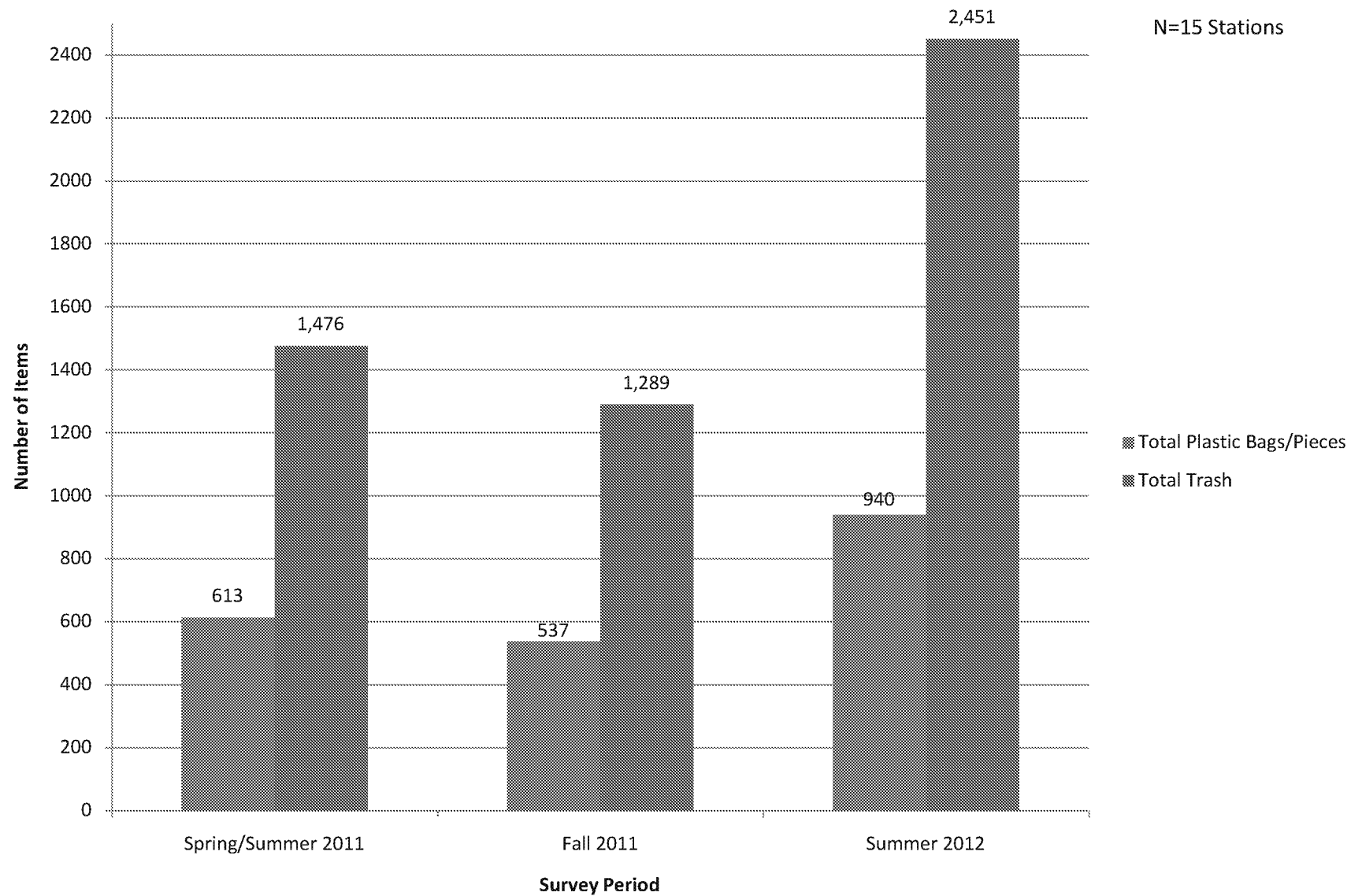
Summary: Total Wet Weight (lbs) of Plastic Bag/Pieces for 250 ft Trash Removal Sites, 2011-2012



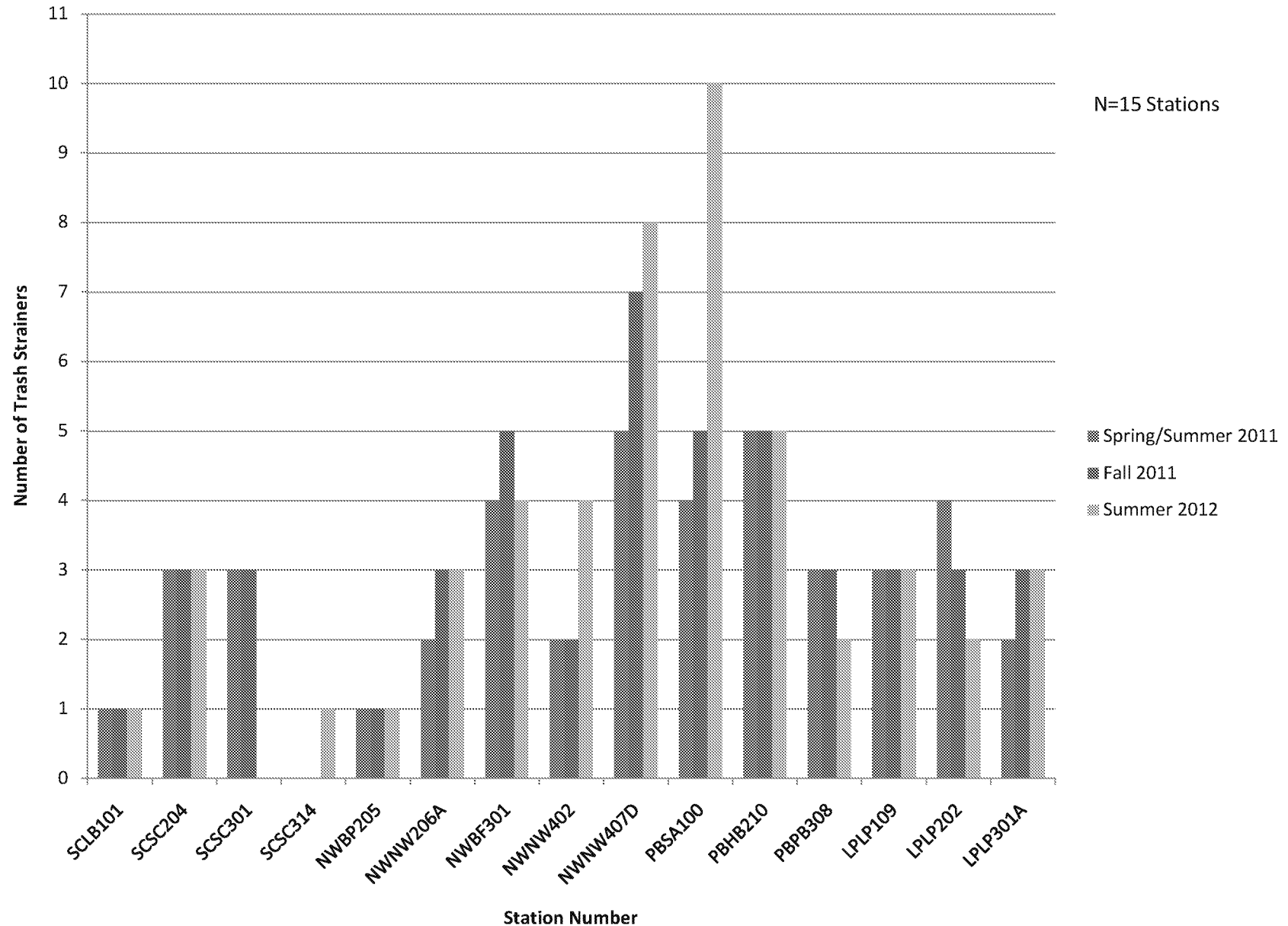
Summary: Combined Total Number of Plastic Bags/Pieces and Total Number of Items, 2011-2012 (PBSA100 Omitted)



Summary: Combined Total Number of Plastic Bags/Pieces and Total Number of Items, 2011-2012 (PBSA100 Included)

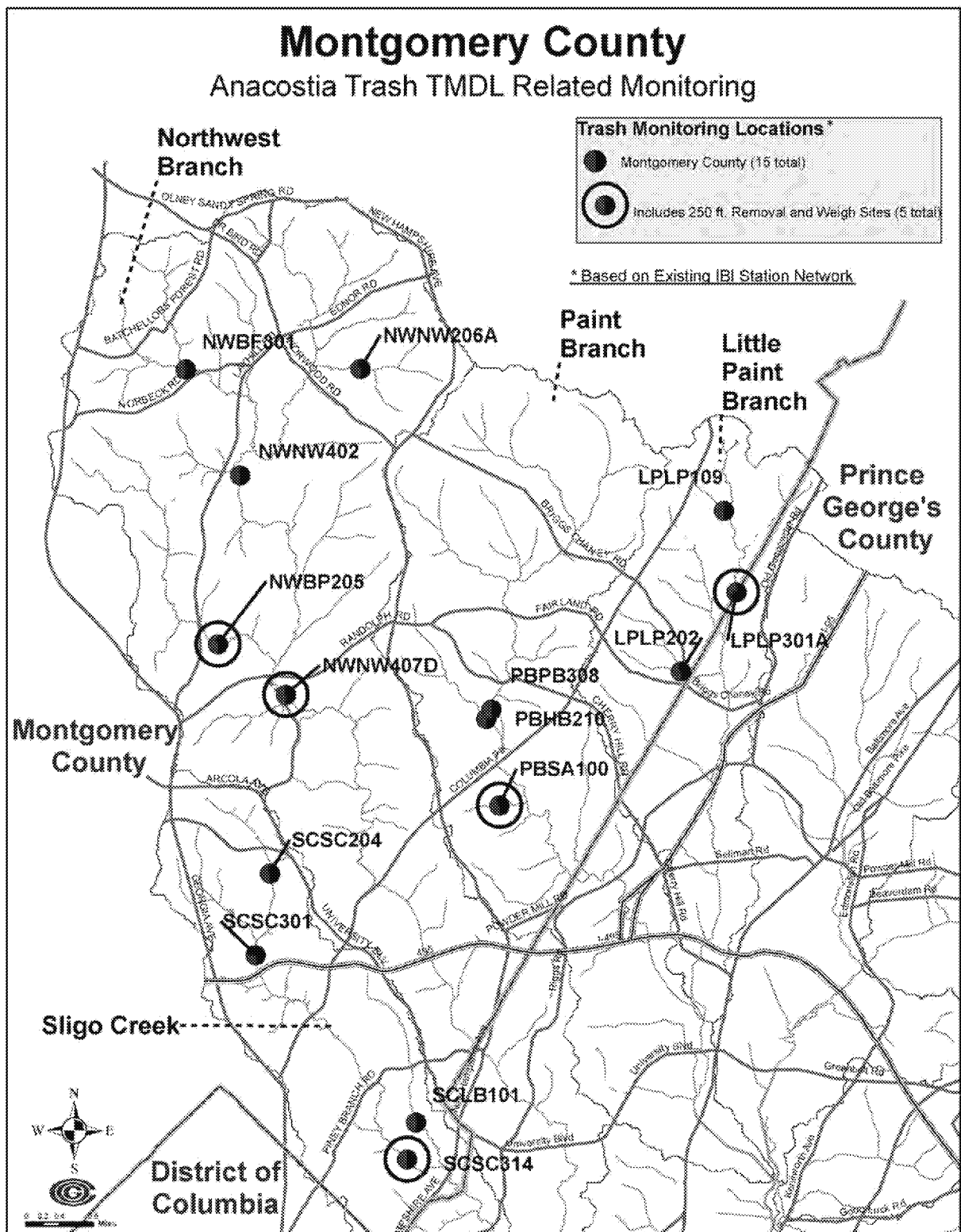


Summary: Number of Trash 'Strainers', 2011-2012*



*-Natural or anthropogenic features such as log/debris dams, large protruding tree roots and rootwads, gabion baskets, large appliances, shopping carts, etc

Montgomery County Trash TMDL Monitoring Update Summary
Fall Sampling Period (December 2012)



I. Sligo Creek Trash Sites (December 2012)

Site ID: SCLB101 (Sligo Creek)	Station Name: Long Branch	Trash Rating¹: Light
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Site ID: SCSC204 (Sligo Creek)	Station Name: University Blvd.	Trash Rating¹: Very Light
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Site ID: SCSC301 (Sligo Creek)	Station Name: Forest Glen Rd.	Trash Rating¹: Very Light
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Site ID: SCSC314 (Sligo Creek)	Station Name: Carroll Ave.	Trash Rating¹: Light
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II. Northwest Branch Trash Sites (December 2012)		
Site ID: NWBP205 (Northwest Branch)	Station Name: Bel Pre Creek	Trash Rating¹: Light



Site ID: NWNW206A (Northwest Branch)	Station Name: Nursery Run	Trash Rating¹: Very Light
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Site ID: NWBF301 (Northwest Branch)	Station Name: Batchellor's Run	Trash Rating¹: Light
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Site ID: NWNW402 (Northwest Branch)	Station Name: Layhill Park	Trash Rating¹: Very Light
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Site ID: NWNW407D (Northwest Branch)	Station Name: Kemp Mill Rd.	Trash Rating¹: Light
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III. Paint Branch Trash Sites (December 2012)

Site ID: PBSA100 ² (Paint Branch)	Station Name: Stewart April Ln.	Trash Rating¹: High
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Site ID: PBHB210 (Paint Branch)	Station Name: Hollywood Branch	Trash Rating¹: Moderate
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Site ID: PBPB308 (Paint Branch)	Station Name: Valley Mill Park	Trash Rating¹: Very Light
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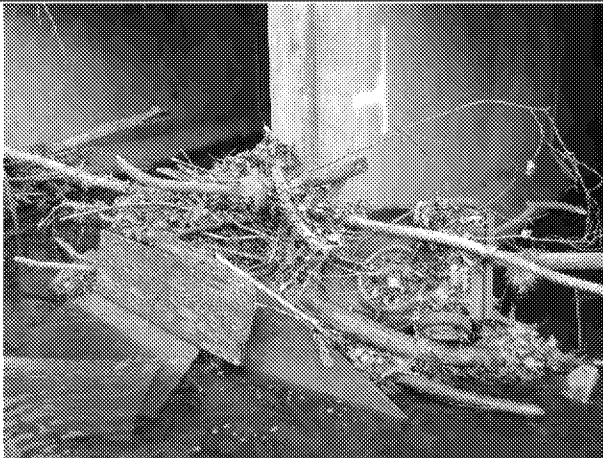


IV. Little Paint Branch Trash Sites (December 2012)

Site ID: LPLP109 (Little Paint Branch)	Station Name: Fairland Park (North)	Trash Rating¹: Light
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Site ID: LPLP202 (Little Paint Branch)	Station Name: Briggs Chaney Rd.	Trash Rating¹: Very Light
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Site ID: LPLP301A (Little Paint Branch)	Station Name: Fairland Park (Central)	Trash Rating¹: Very Light
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¹ =	No. of Items/100 ft	Verbal Ranking
	0-10.0	None-Very Light
	10.1-25.0	Light
	25.1-50.0	Moderate
	>= 50.1	High

²=COG generated site ID

Table 1 – Summary: COG Trash TMDL Monitoring for Montgomery County, 500 ft. Counts-December 2012, (N=15)

Site ID	Site Name	Sub-watershed	Length (ft)	Top 3 Items ¹ (Numbers)	Total Number of Items	Number of Items per 100 ft	Verbal Ranking ²
SCLB101	Long Branch	Sligo Creek	500	1,9,5	85	17.0	Light
SCSC204	University Blvd	Sligo Creek	500	1,4,8	30	6.0	Very Light
SCSC301	Forest Glen Rd	Sligo Creek	500	1,4,(5,9,10e Tied)	13	2.6	Very Light
SCSC314	Carroll Avenue	Sligo Creek	500	1,9,20	60	12.0	Light
NWBP205	Bel Pre Creek	Northwest Branch	500	1,2,5	113	22.6	Light
NWNW206A	Nursery Run	Northwest Branch	500	16,1,2	21	4.2	Very Light
NWBF301	Batchellors Run	Northwest Branch	500	16,1,13b	54	10.8	Light
NWNW402	Layhill Park	Northwest Branch	500	19,20,(1,5,8 Tied)	19	3.8	Very Light
NWNW407D	Kemp Mill Rd	Northwest Branch	500	1,2,4	53	10.6	Light
PBSA100*	Stewart April Ln	Paint Branch	500	1,2,5	494	98.8	High
PBHB210	Hollywood Branch	Paint Branch	500	1,2,9	169	33.8	Moderate
PBPB308	Valley Mill Park	Paint Branch	500	1,5,9	30	6.0	Very Light
LPLP109	Fairland Regional Park (north)	Little Paint Branch	500	1,2,9	86	17.2	Light
LPLP202	Briggs Chaney Rd	Little Paint Branch	500	1,13c,(9,12 Tied)	21	4.2	Very Light
LPLP301A	Fairland Regional Park (central)	Little Paint Branch	500	1,2,9	47	9.4	Very Light

¹= Trash Item Key: 1 = Plastic bags; 2 = Plastic bottles; 3 = Glass; 4 = Aluminum Cans; 5 = Styrofoam cups, etc.; 6 = Paper; 7 = Cardboard; 8 = Cloth, Clothing, Carpeting; 9 = Food Packaging; 10 Auto: A. Oil containers, B. Oil filters, Antifreeze containers, D. Body parts large >1 ft², E. Body parts small <1 ft²; 11 = Car batteries; 12 = Tires; 13 = Construction Debris: A. Bricks, B. Concrete, C. Lumber, D. Misc. (drywall, etc.); 14 = Appliances; 15 = Wooden pallets; 16 = Metal; 17= Shopping Carts; 18 = Toiletries/Drug containers; 19 = Sports equipment/ Toys; 20 = Miscellaneous

²= * =COG generated site ID

No. of Items/100 ft	Verbal Ranking
0-10.0	None-Very Light
10.1-25.0	Light
25.1-50.0	Moderate
>= 50.1	High

Table 2 – Summary: COG Trash TMDL Monitoring for Montgomery County, 250 ft. Removal and Weights-December 2012, (N=5)

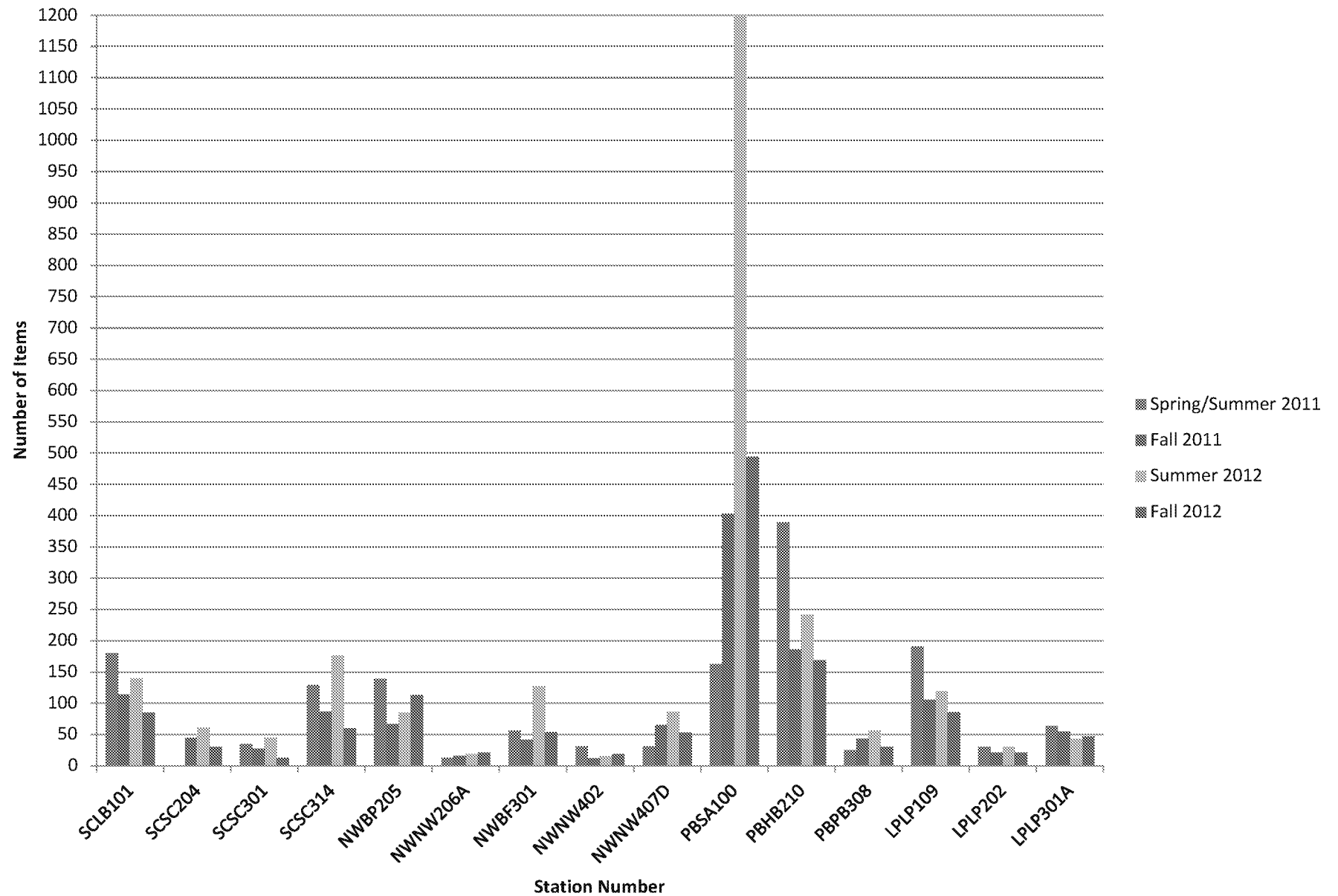
Site ID	Site Name	Sub-watershed	Length (ft)	Total Number of Items	Total Number of Plastic Bags/Pieces	Total Wet Weight of Plastic Bags/Pieces* (lbs)	Total Weight (lbs)	Weight (lbs) per 100 ft
SCSC314	Carroll Avenue	Sligo Creek	250	49	20	2.0	4.8	1.9
NWBP205	Bel Pre Creek	Northwest Branch	250	43	23	2.9	8.0	3.2
NWNW407D	Kemp Mill Rd	Northwest Branch	250	18	5	0.2	1.6	0.6
PBSA100	Stewart April Ln	Paint Branch	250	541	209	14.8	28.2	11.3
LPLP301A	Fairland Regional Park (central)	Little Paint Branch	250	9	3	0.1	0.5	0.2

*-Bags heavily contaminated with sandy material

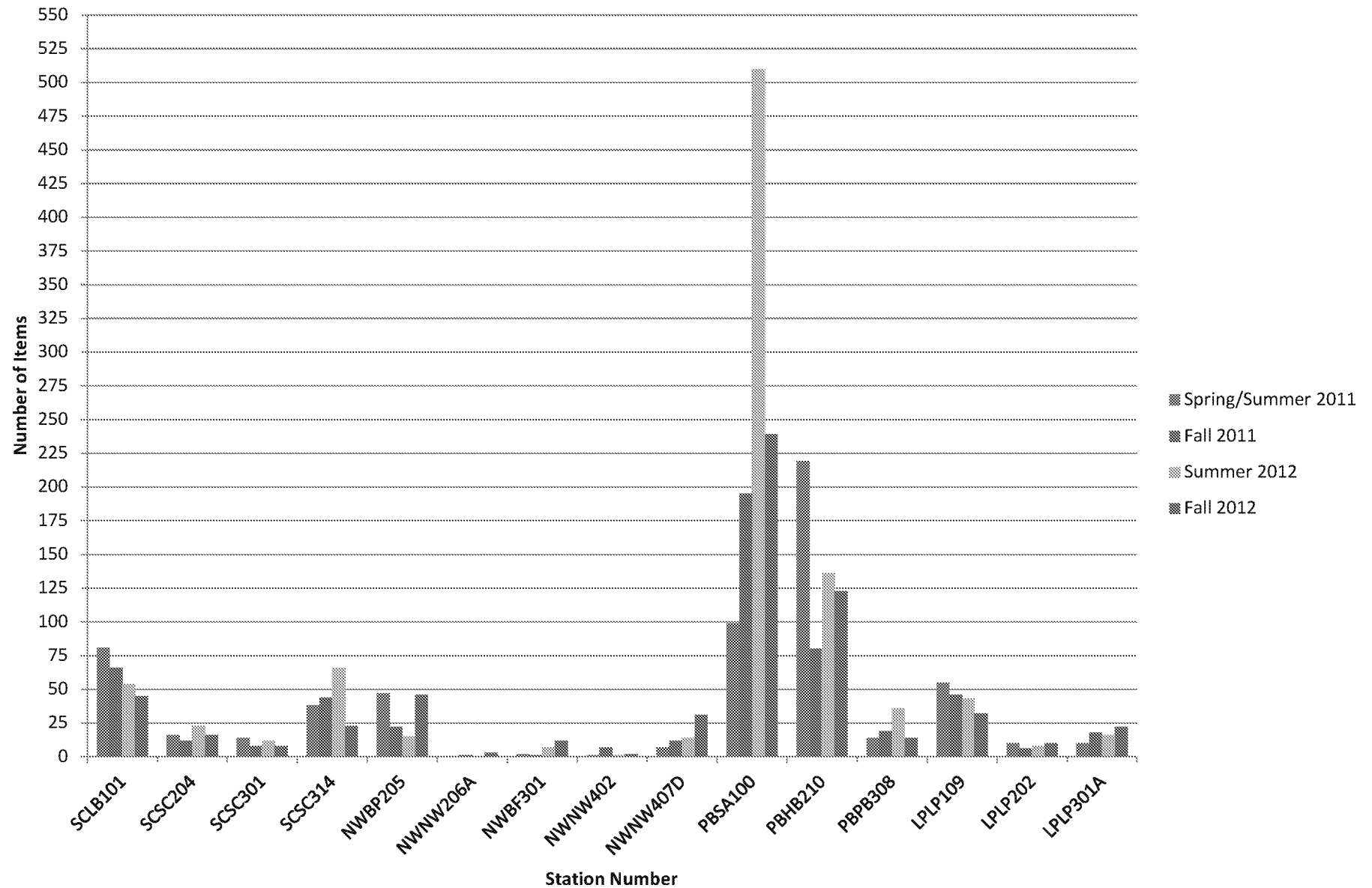
Table 3 – Approximate Monthly Trash Accumulation Rate July 2012 to December 2012, (N=5)

Site ID	Site Name	Sub-watershed	Total Weight (lbs)	Accumulation Period (Months)	Monthly Trash Accumulation (lbs per Month)
SCSC314	Carroll Avenue	Sligo Creek	4.8	5	1.0
NWBP205	Bel Pre Creek	Northwest Branch	8.0		1.6
NWNW407D	Kemp Mill Rd	Northwest Branch	1.6		0.3
PBSA100	Stewart April Ln	Paint Branch	28.2		5.6
LPLP301A	Fairland Regional Park (central)	Little Paint Branch	0.5		0.1

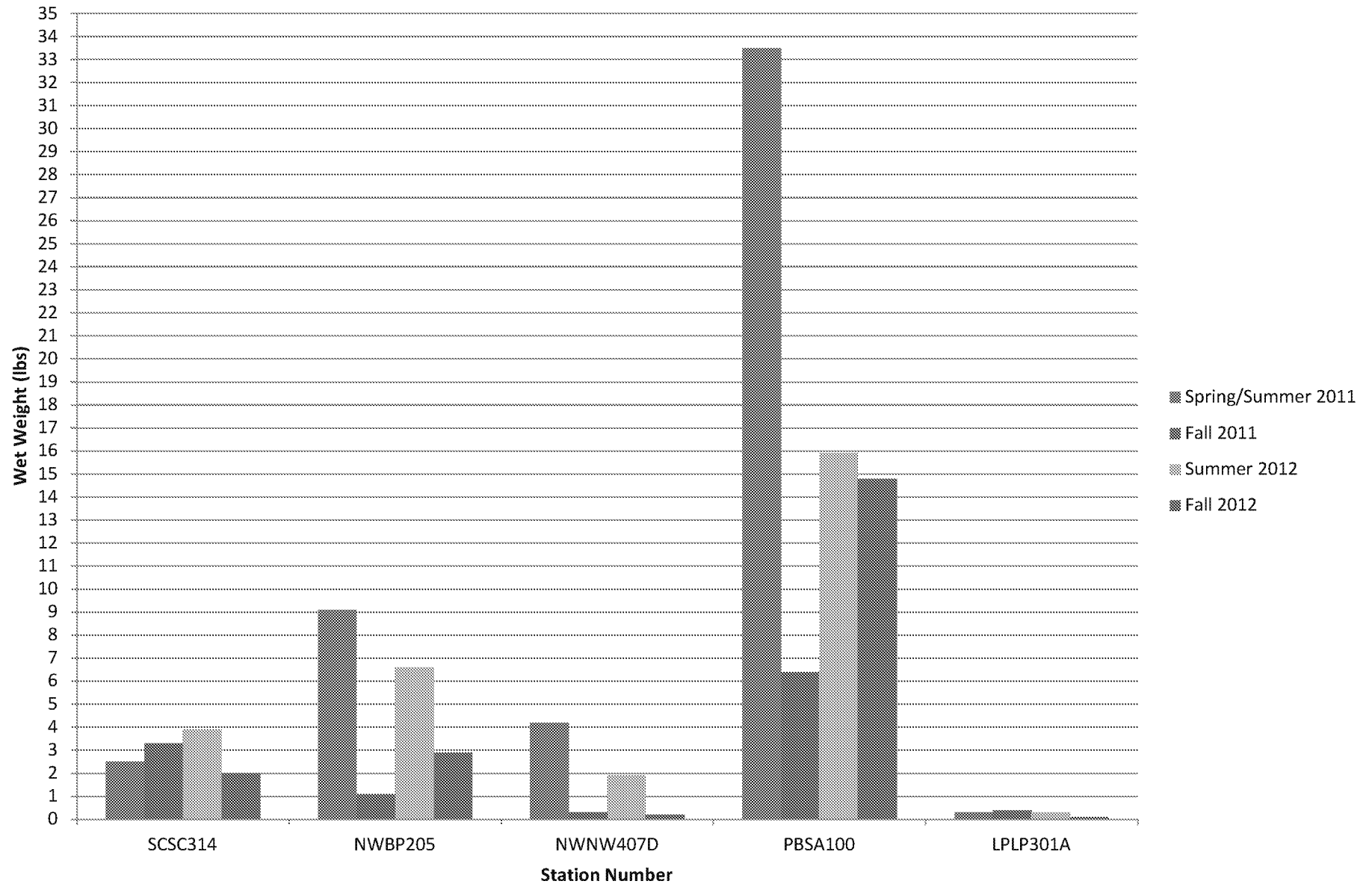
Summary: Total Number of Trash Items for 500 ft Count Sites, 2011-2012



Summary: Total Number of Plastic Bags/Pieces for 500 ft Count Sites, 2011-2012

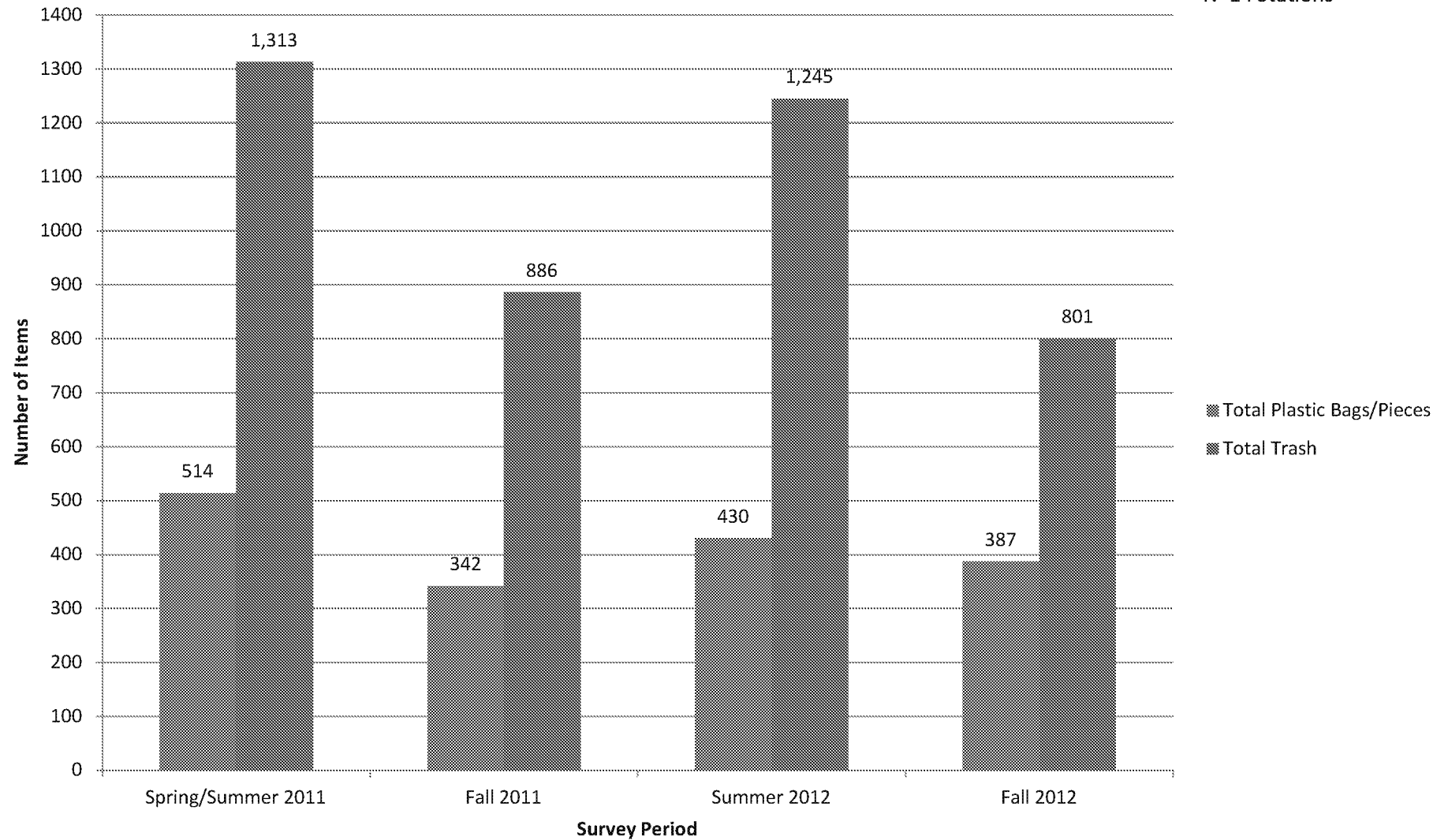


Summary: Total Wet Weight (lbs) of Plastic Bag/Pieces for 250 ft Trash Removal Sites, 2011-2012

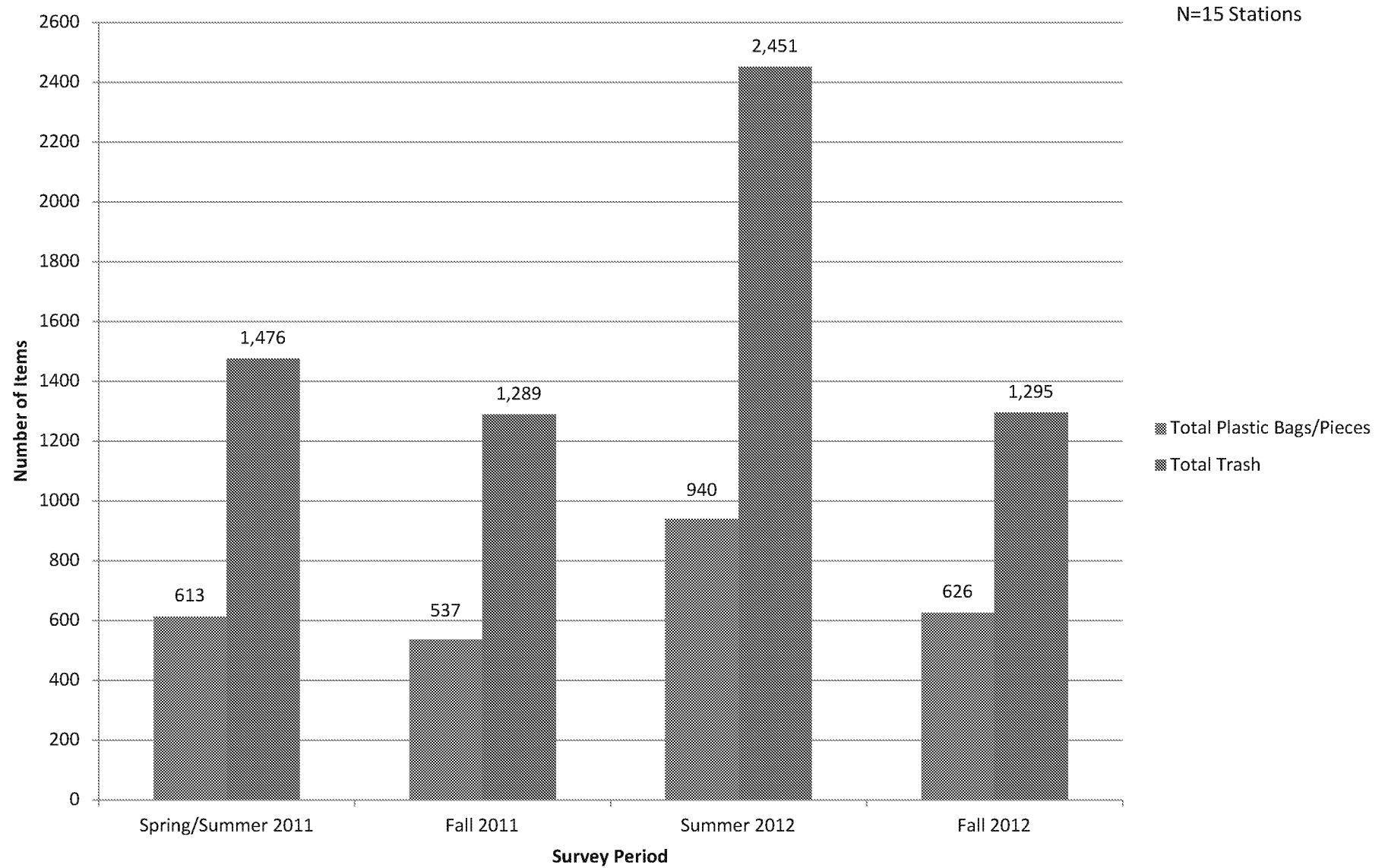


Summary: Combined Total Number of Plastic Bags/Pieces and Total Number of Items, 2011-2012 (PBSA100 Omitted)

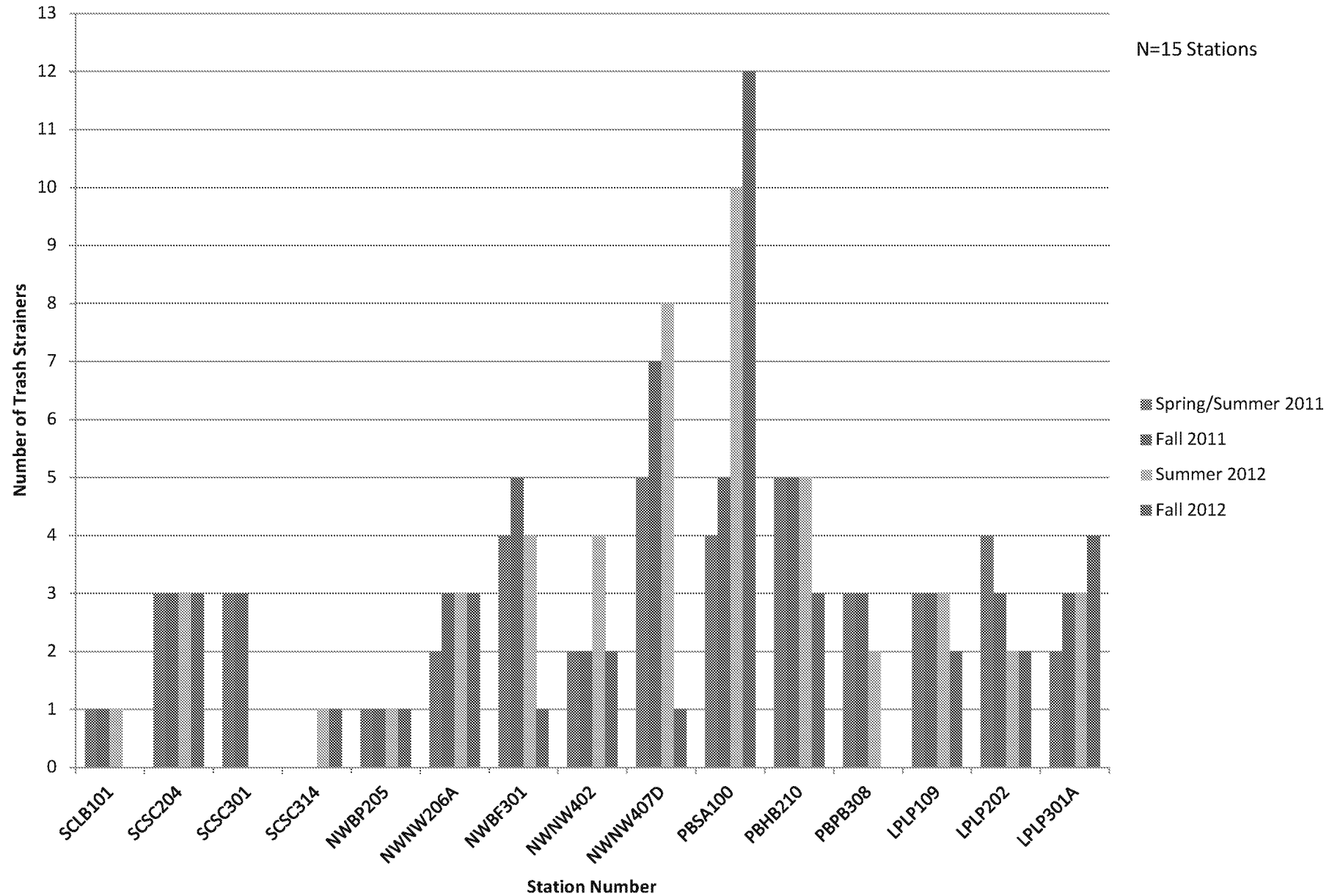
N=14 Stations



Summary: Combined Total Number of Plastic Bags/Pieces and Total Number of Items, 2011-2012 (PBSA100 Included)



Summary: Number of Trash 'Strainers', 2011-2012*



Montgomery County Trash TMDL Monitoring Update Summary Notes

Fall Sampling Period (December 2012)

The December 2012 trash monitoring data reflect both the Sligo Creek 'Sweep the Creek' trash reduction event and the associated high flows during Hurricane Sandy's precipitation event. At the Sligo Creek Sweep Creek event (September 29th and 30th), 409 volunteers participated in trash removal activities; removing trash in and along the stream. Starting from upstream of University Boulevard down to New Hampshire Avenue volunteers removed 324 bags of trash. It should be noted that fall 2012 trash levels at the Sligo Creek sites were in the very light to light range vis-à-vis very light to moderate range in summer 2012 monitoring survey.

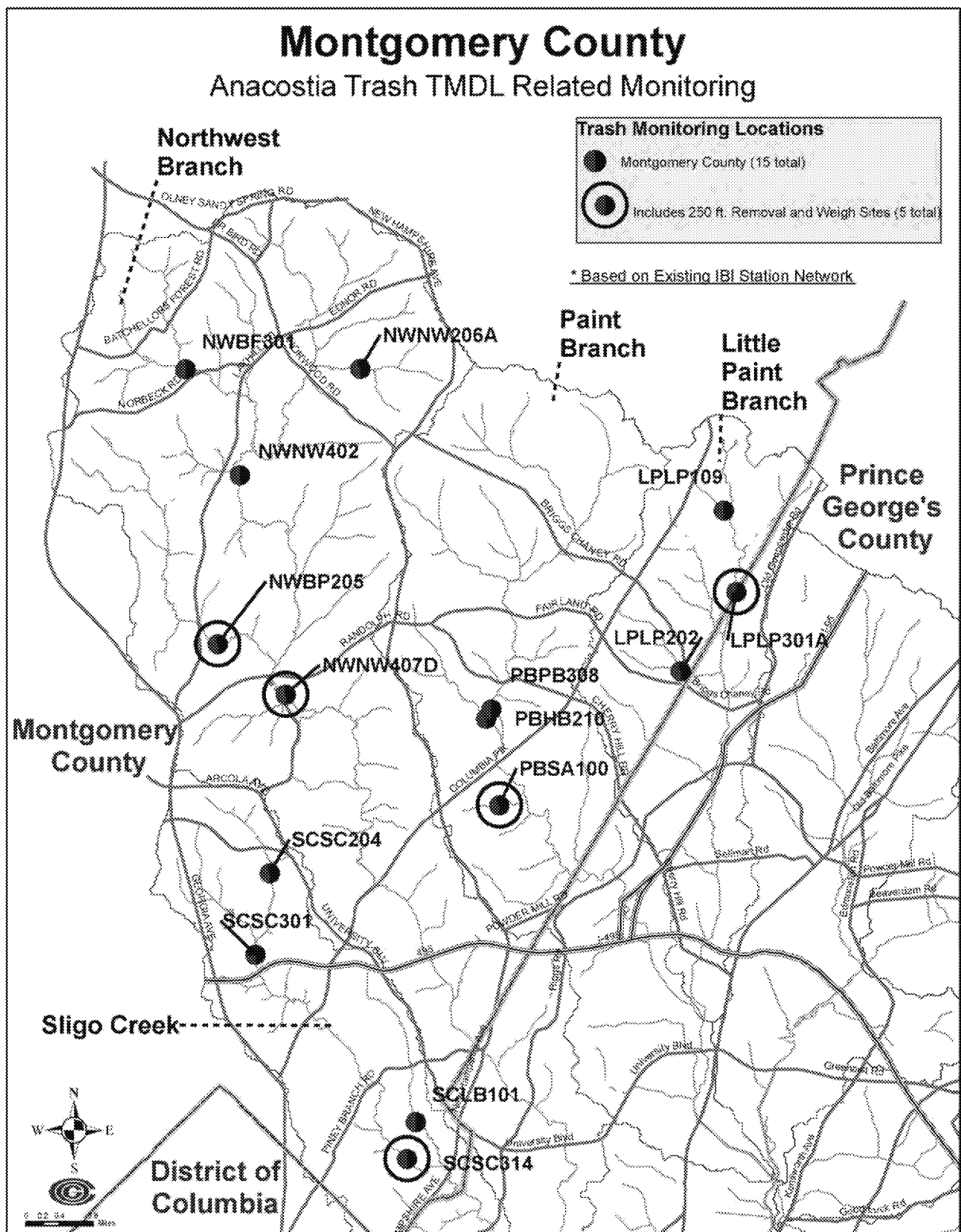
The Hurricane Sandy rainfall event started on October 29th and ended on October 30th. Official reported rainfall totals across the Washington metropolitan area ranged from 4.1 (DCA) to 6.0 (USDA/BARC) inches. Unofficial reports of a 8-9.5 inches of rainfall were also noted. Table 1 highlights the maximum event stream flows (cubic feet per second) at four Anacostia USGS stream gage locations associated with Hurricane Sandy (October 29, 2012). Such high flows transport trash and debris onto the adjacent flood plain and/or further downstream.

Table 1: Maximum Discharges During Hurricane Sandy

USGS Stream Gage Location Description	Max. Discharge (cubic feet per second)
1. Sligo Creek near Takoma Park, MD	900
2. NWB Near Colesville, MD	3,000
3. NWB Near Hyattsville, MD	6,000
4. Paint Branch Near College Park, MD	1,000

In the December 2012 monitoring survey, there were 35 total strainers counted, which is lower than the three previous monitoring dates (i.e., summer 2011, fall 2011, and summer 2012). It should be noted that after the summer 2012 survey, the total number of strainers increased at two sites, (i.e., Stewart /April Lane (PBSA100) and Little Paint Branch at Fairland Regional Park (LPLP301A)). At Stewart /April Lane, strainers increased by two (to 12 total); but the total number of trash items decreased. While at the Fairland Regional Park site, there was an increase of one strainer (to four total) and trash levels (i.e., very light) remained the same.

Montgomery County Trash TMDL Monitoring Update Summary
Summer Sampling Period (June 2013)



I. Sligo Creek Trash Sites (June 2013)

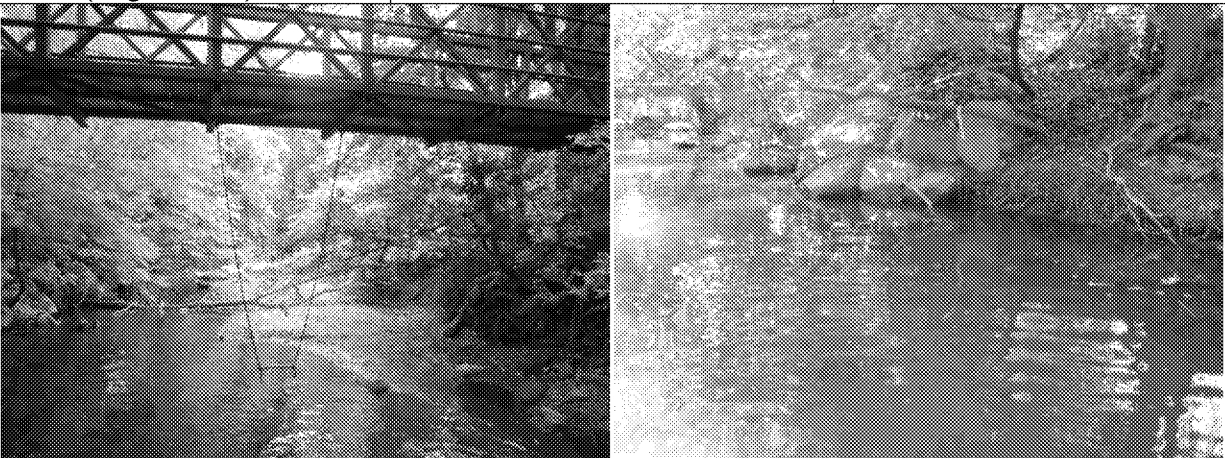
Site ID: SCLB101 (Sligo Creek)	Station Name: Long Branch	Trash Rating¹: Very Light
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Site ID: SCSC204 (Sligo Creek)	Station Name: University Blvd.	Trash Rating¹: Very Light
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Site ID: SCSC301 (Sligo Creek)	Station Name: Forest Glen Rd.	Trash Rating¹: Very Light
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Site ID: SCSC314 (Sligo Creek)	Station Name: Carroll Ave.	Trash Rating¹: Moderate
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II. Northwest Branch Trash Sites (June 2013)		
Site ID: NWBP205 (Northwest Branch)	Station Name: Bel Pre Creek	Trash Rating¹: Very Light



Site ID: NWNW206A (Northwest Branch)	Station Name: Nursery Run	Trash Rating¹: Very Light
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Site ID: NWBF301 (Northwest Branch)	Station Name: Batchellor's Run	Trash Rating¹: Light
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Site ID: NWNW402 (Northwest Branch)	Station Name: Layhill Park	Trash Rating¹: Very Light
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Site ID: NWNW407D (Northwest Branch)	Station Name: Kemp Mill Rd.	Trash Rating¹: Light
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III. Paint Branch Trash Sites (June 2013)

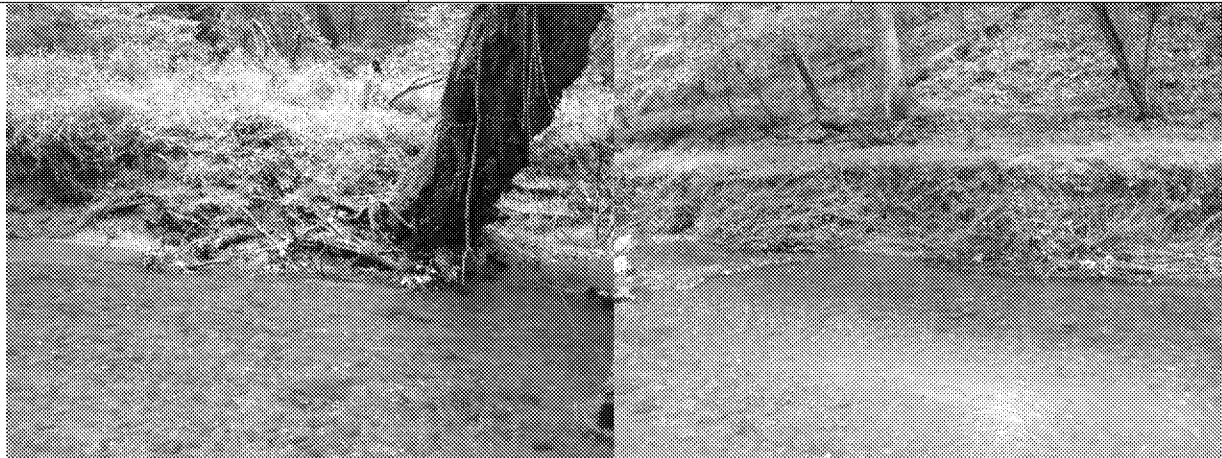
Site ID: PBSA100 ² (Paint Branch)	Station Name: Stewart April Ln.	Trash Rating¹: High
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Site ID: PBHB210 (Paint Branch)	Station Name: Hollywood Branch	Trash Rating¹: High
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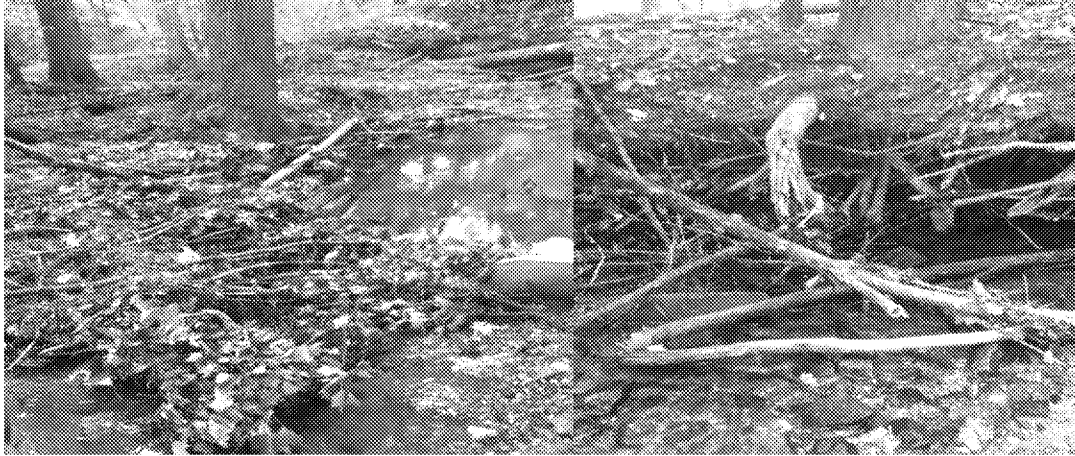


Site ID: PBPB308 (Paint Branch)	Station Name: Valley Mill Park	Trash Rating¹: Very Light
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Little Paint Branch Trash Sites (June 2013)

Site ID: LPLP109 (Little Paint Branch)	Station Name: Fairland Park (North)	Trash Rating¹: Moderate
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Site ID: LPLP202 (Little Paint Branch)	Station Name: Briggs Chaney Rd.	Trash Rating¹: Very Light
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Site ID: LPLP301A (Little Paint Branch)	Station Name: Fairland Park (Central)	Trash Rating¹: Light
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¹ =	No. of Items/100 ft	Verbal Ranking
	0-10.0	None-Very Light
	10.1-25.0	Light
	25.1-50.0	Moderate
	>= 50.1	High

²=COG generated site ID

Table 1 – Summary: COG Trash TMDL Monitoring for Montgomery County, 500 ft. Counts-June 2013, (N=15)

Site ID	Site Name	Sub-watershed	Length (ft)	Top 3 Items ¹ (Numbers)	Total Number of Items	Number of Items per 100 ft	Verbal Ranking ²
SCLB101	Long Branch	Sligo Creek	500	1,4,2	48	9.6	Very Light
SCSC204	University Blvd	Sligo Creek	500	9,1,2	34	6.8	Very Light
SCSC301	Forest Glen Rd	Sligo Creek	500	1,2,4	15	3.0	Very Light
SCSC314	Carroll Avenue	Sligo Creek	500	1,9,13a	179	35.8	Moderate
NWBP205	Bel Pre Creek	Northwest Branch	500	1,9,2	41	8.2	Very Light
NWNW206A	Nursery Run	Northwest Branch	500	(13c,16 Tied),13a	13	2.6	Very Light
NWBF301	Batchellors Run	Northwest Branch	500	16,13a,20	102	20.4	Light
NWNW402	Layhill Park	Northwest Branch	500	2, (1,13b,13c,20 Tied)	12	2.4	Very Light
NWNW407D	Kemp Mill Rd	Northwest Branch	500	1,4,2	90	18.0	Light
PBSA100	Stewart April Ln	Paint Branch	500	1,9,2	616	123.2	High
PBHB210	Hollywood Branch	Paint Branch	500	1,9,4	252	50.4	High
PBPB308	Valley Mill Park	Paint Branch	500	1,2,8	18	3.6	Very Light
LPLP109	Fairland Regional Park (north)	Little Paint Branch	500	1,2,9	201	40.2	Moderate
LPLP202	BriggsChaney Rd	Little Paint Branch	500	9,2, (1,12,19 Tied)	23	4.6	Very Light
LPLP301A	Fairland Regional Park (central)	Little Paint Branch	500	1,9,2	59	11.8	Light

¹= Trash Item Key: 1 = Plastic bags; 2 = Plastic bottles; 3 = Glass; 4 = Aluminum Cans; 5 = Styrofoam cups, etc.; 6 = Paper; 7 = Cardboard; 8 = Cloth, Clothing, Carpeting; 9 = Food Packaging; 10 Auto: A. Oil containers, B. Oil filters, Antifreeze containers, D. Body parts large >1 ft², E. Body parts small <1 ft²; 11 = Car batteries; 12 = Tires; 13 = Construction Debris: A. Bricks, B. Concrete, C. Lumber, D. Misc. (drywall, etc.); 14 = Appliances; 15 = Wooden pallets; 16 = Metal; 17= Shopping Carts; 18 = Toiletries/Drug containers; 19 = Sports equipment/ Toys; 20 = Miscellaneous

²=

No. of Items/100 ft	Verbal Ranking
0-10.0	None-Very Light
10.1-25.0	Light
25.1-50.0	Moderate
>= 50.1	High

*=COG generated site ID

Table 2 – Summary: COG Trash TMDL Monitoring for Montgomery County, 250 ft. Removal and Weights-June 2013, (N=5)

Site ID	Site Name	Sub-watershed	Length (ft)	Total Number of Items	Total Number of Plastic Bags/Pieces	Total Wet Weight of Plastic Bags/Pieces (lbs)*	Total Weight (lbs)	Weight (lbs) per 100 ft
SCSC314	Carroll Avenue	Sligo Creek	250	52	16	1.8	7.2	2.8
NWBP205	Bel Pre Creek	Northwest Branch	250	61	29	2.6	5.4	2.2
NWNW407D	Kemp Mill Rd	Northwest Branch	250	34	13	2.4	6.2	2.5
PBSA100	Stewart April Ln	Paint Branch	250	520	140	11.4**	31.6	12.6
LPLP301A	Fairland Regional Park (central)	Little Paint Branch	250	26	4	0.2	1.8	0.7

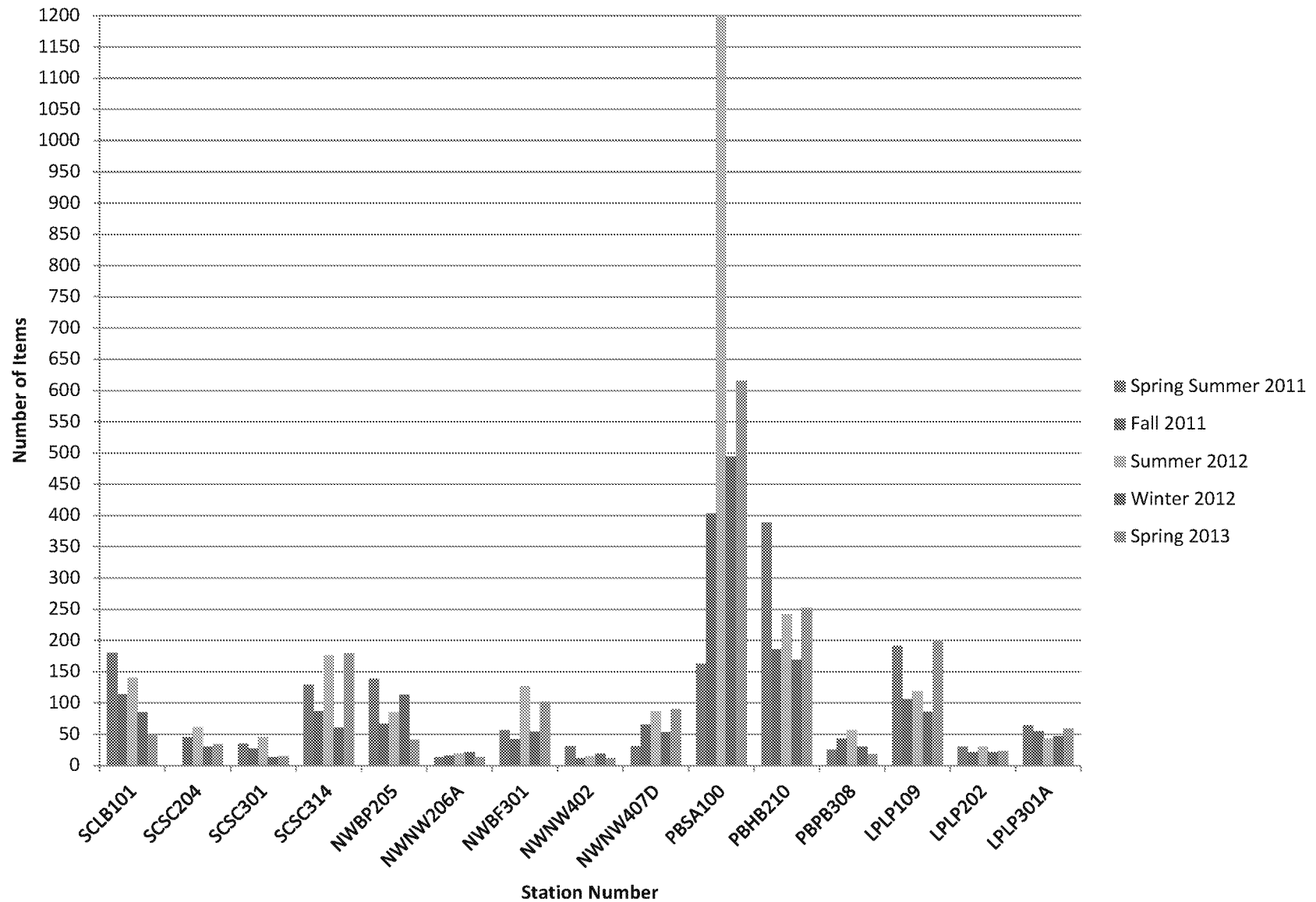
*-Wet weights and may include very small amount of sandy material

**-Weight is post 4/20/13 Stewart-April Lane stream clean up

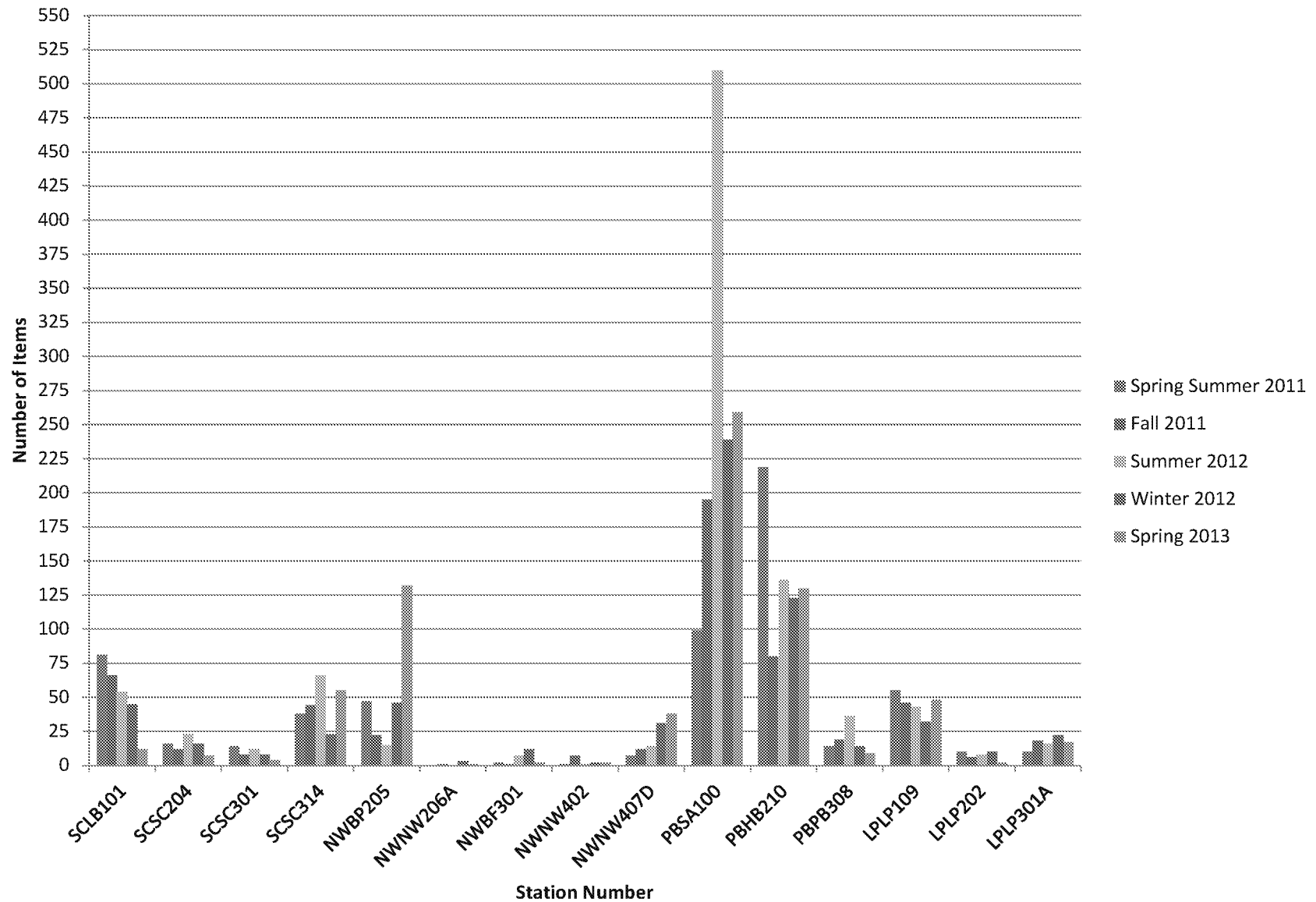
Table 3 – Approximate Monthly Trash Accumulation Rate-December 2012 to June 2013, (N=5)

Site ID	Site Name	Sub-watershed	Total Weight (lbs)	Accumulation Period (Months)	Monthly Trash Accumulation (lbs per Month)
SCSC314	Carroll Avenue	Sligo Creek	7.2	6	1.2
NWBP205	Bel Pre Creek	Northwest Branch	5.4		0.9
NWNW407D	Kemp Mill Rd	Northwest Branch	6.2		1.0
PBSA100	Stewart April Ln	Paint Branch	31.6		5.3
LPLP301A	Fairland Regional Park (central)	Little Paint Branch	1.8		0.3

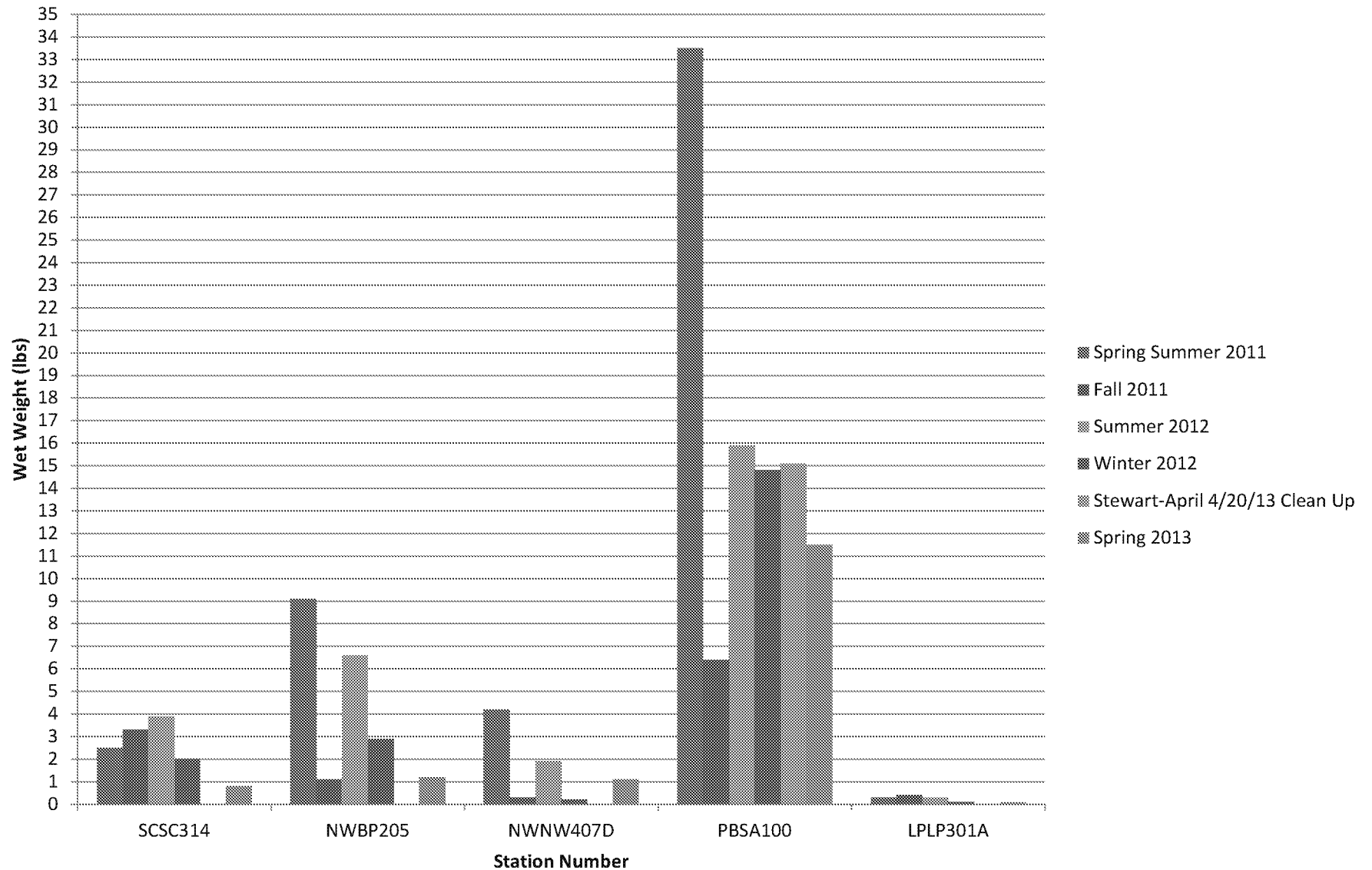
Summary: Total Number of Trash Items for 500 ft Count Sites, 2011-2013



Summary: Total Number of Plastic Bags/Pieces for 500 ft Count Sites, 2011-2013

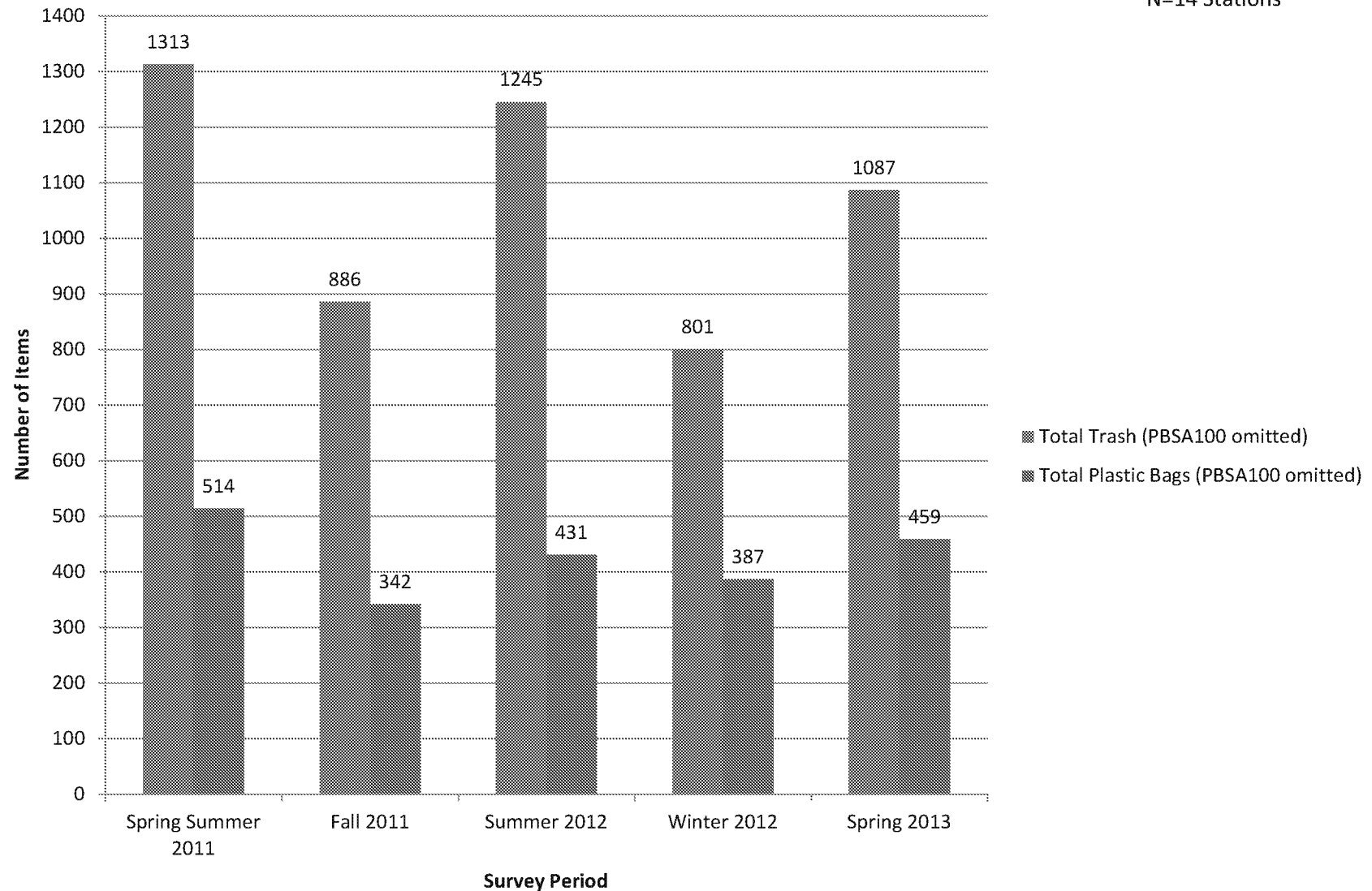


Summary: Total Wet Weight (lbs) of Plastic Bag/Pieces for 250 ft Trash Removal Sites, 2011-2013

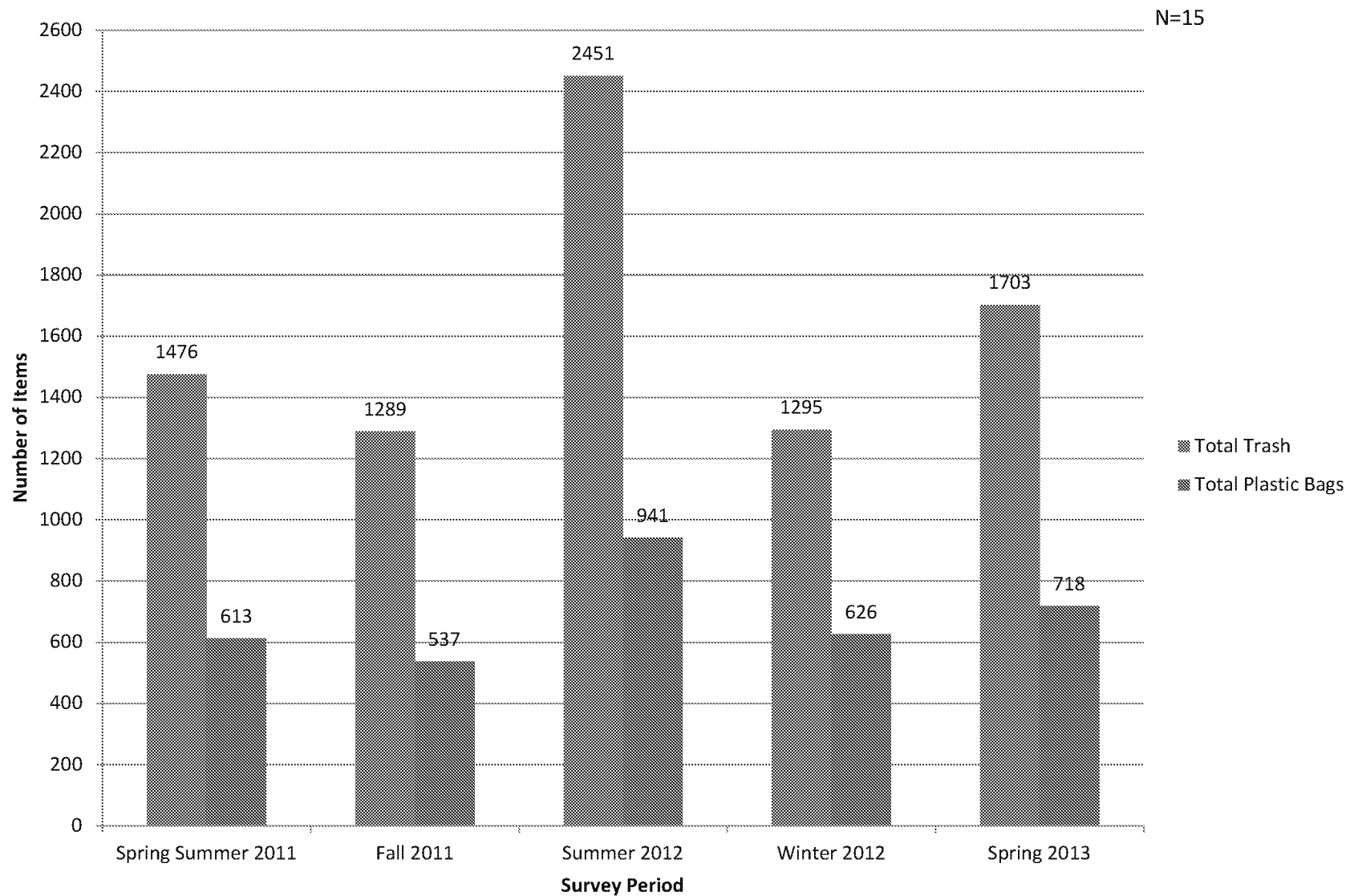


Summary: Combined Total Number of Plastic Bags/Pieces and Total Number of Items, 2011-2013 (PBSA100 Omitted)

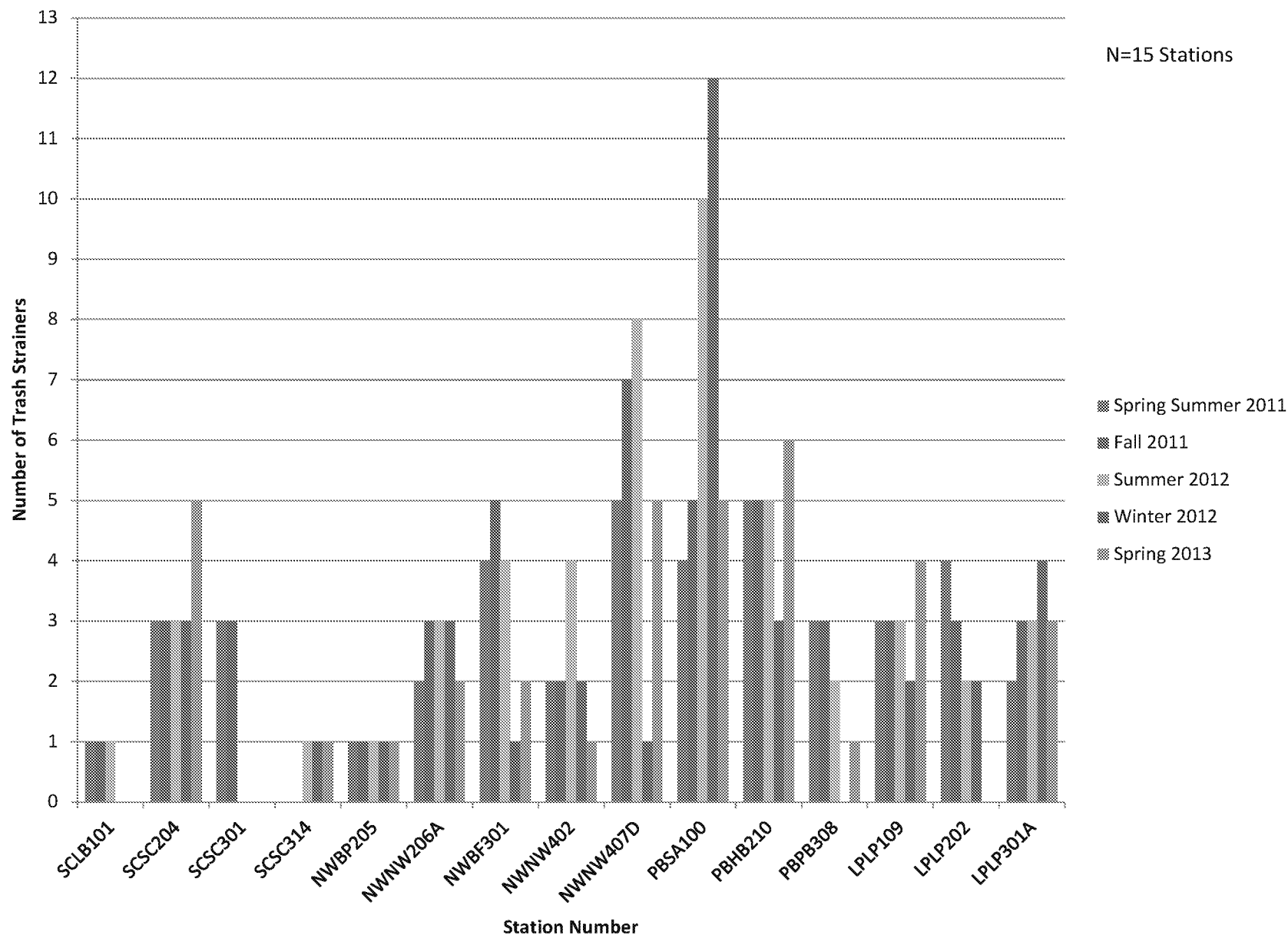
N=14 Stations



Summary: Combined Total Number of Plastic Bags/Pieces and Total Number of Items, 2011-2013 (PBSA100 Included)

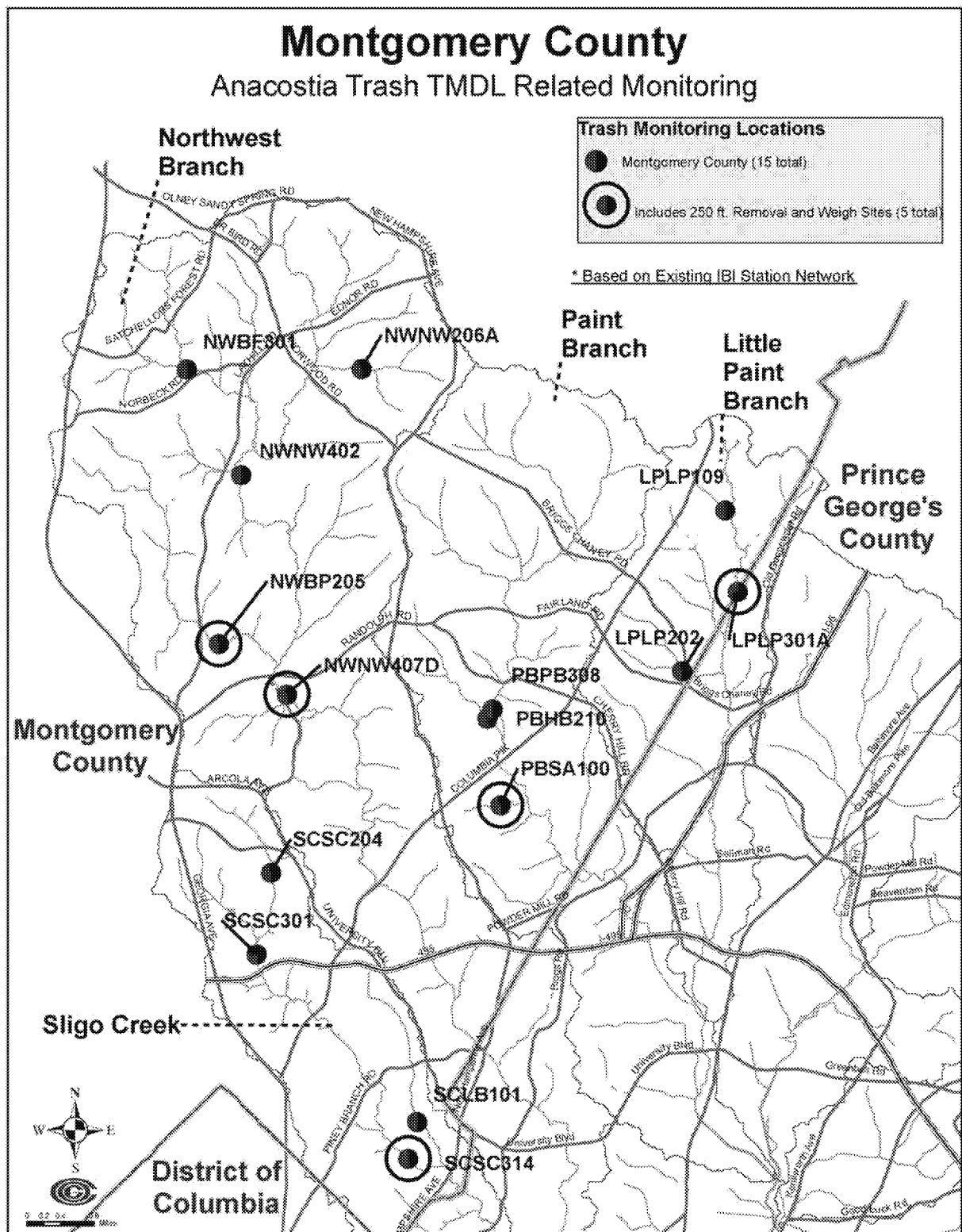


Summary: Number of Trash 'Strainers', 2011-2013*



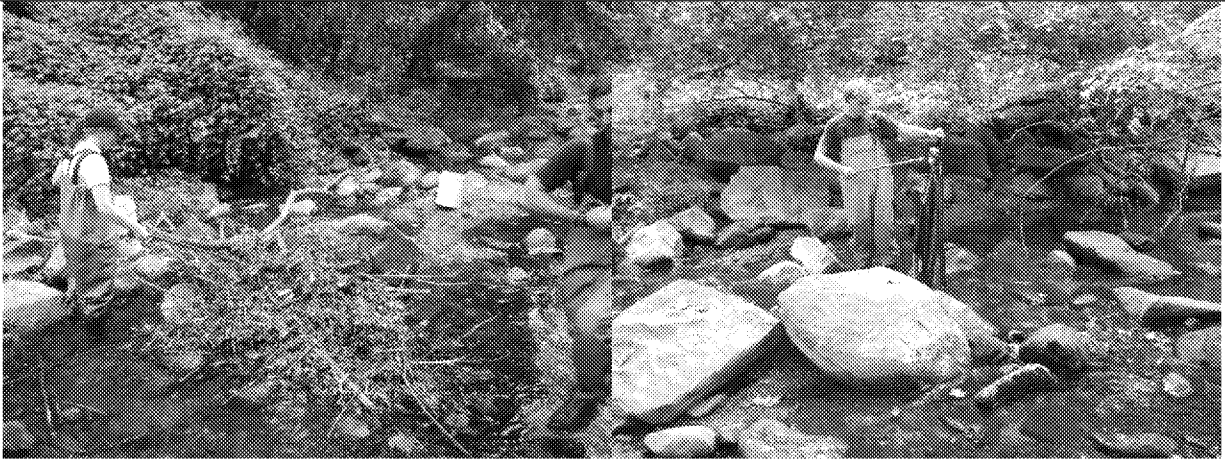
*-Natural or anthropogenic features such as log/debris dams, large protruding tree roots and rootwads, gabion baskets, large appliances, shopping carts, etc

Montgomery County Trash TMDL Monitoring Update Summary
Summer Sampling Period (September-October 2013)



I. Sligo Creek Trash Sites (September- October 2013)**Site ID:** SCLB101 (Sligo Creek)**Station Name:** Long Branch**Trash Rating¹:** Moderate**Site ID:** SCSC204
(Sligo Creek)**Station Name:** University Blvd.**Trash Rating¹:** Light**Site ID:** SCSC301
(Sligo Creek)**Station Name:** Forest Glen Rd.**Trash Rating¹:** Very Light

Site ID: SCSC314 (Sligo Creek)	Station Name: Carroll Ave.	Trash Rating¹: Moderate
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II. Northwest Branch Trash Sites (September- October 2013)		
Site ID: NWBP205 (Northwest Branch)	Station Name: Bel Pre Creek	Trash Rating¹: Light



Site ID: NWNW206A (Northwest Branch)	Station Name: Nursery Run	Trash Rating¹: Very Light
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Site ID: NWBF301 (Northwest Branch)	Station Name: Batchellor's Run	Trash Rating¹: Light
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Site ID: NWNW402 (Northwest Branch)	Station Name: Layhill Park	Trash Rating¹: Very Light
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Site ID: NWNW407D (Northwest Branch)	Station Name: Kemp Mill Rd.	Trash Rating¹: Light
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III. Paint Branch Trash Sites (September- October 2013)

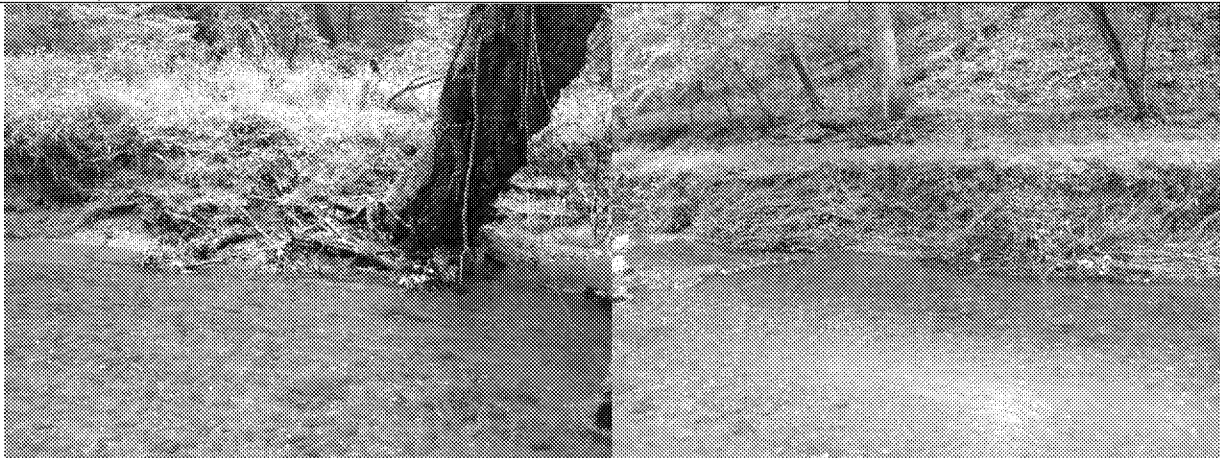
Site ID: PBSA100 ² (Paint Branch)	Station Name: Stewart April Ln.	Trash Rating¹: High
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Site ID: PBHB210 (Paint Branch)	Station Name: Hollywood Branch	Trash Rating¹: Moderate
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Site ID: PBPB308 (Paint Branch)	Station Name: Valley Mill Park	Trash Rating¹: Very Light
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IV. Little Paint Branch Trash Sites (September- October 2013)

Site ID: LPLP109 (Little Paint Branch)	Station Name: Fairland Park (North)	Trash Rating¹: Moderate
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Site ID: LPLP202 (Little Paint Branch)	Station Name: Briggs Chaney Rd.	Trash Rating¹: Very Light
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Site ID: LPLP301A (Little Paint Branch)	Station Name: Fairland Park (Central)	Trash Rating¹: Very Light
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¹ =	No. of Items/100 ft	Verbal Ranking
	0-10.0	None-Very Light
	10.1-25.0	Light
	25.1-50.0	Moderate
	>= 50.1	High

²=COG generated site ID

Table 1 – Summary: COG Trash TMDL Monitoring for Montgomery County, 500 ft. Counts- September- October 2013, (N=15)

Site ID	Site Name	Sub-watershed	Length (ft)	Top 3 Items ¹ (Numbers)	Total Number of Items	Number of Items per 100 ft	Verbal Ranking ²
SCLB101	Long Branch	Sligo Creek	500	1,9,20	134	26.8	Moderate
SCSC204	University Blvd	Sligo Creek	500	1,9,5	61	12.2	Light
SCSC301	Forest Glen Rd	Sligo Creek	500	1,9,20	36	7.2	Very Light
SCSC314	Carroll Avenue	Sligo Creek	500	1,9,20	172	34.4	Moderate
NWBP205	Bel Pre Creek	Northwest Branch	500	1,4, (2, 9 Tied)	84	16.8	Light
NWNW206A	Nursery Run	Northwest Branch	500	13c,16,(1,13a,20 Tied)	25	5.0	Very Light
NWBF301	Batchellors Run	Northwest Branch	500	16,13a,1	88	17.6	Light
NWNW402	Layhill Park	Northwest Branch	500	2,1,13a	17	3.4	Very Light
NWNW407D	Kemp Mill Rd	Northwest Branch	500	1,2,9	70	14.0	Light
PBSA100	Stewart April Ln	Paint Branch	500	1,9,2	694	138.8	High
PBHB210	Hollywood Branch	Paint Branch	500	1,9,20	137	27.4	Moderate
PBPB308	Valley Mill Park	Paint Branch	500	1,13c	3	0.6	Very Light
LPLP109	Fairland Regional Park (north)	Little Paint Branch	500	1,2,9	128	25.6	Moderate
LPLP202	BriggsChaney Rd	Little Paint Branch	500	1,2,5	19	3.8	Very Light
LPLP301A	Fairland Regional Park (central)	Little Paint Branch	500	1,9,(5,8 Tied)	28	5.6	Very Light

¹= Trash Item Key: 1 = Plastic bags; 2 = Plastic bottles; 3 = Glass; 4 = Aluminum Cans; 5 = Styrofoam cups, etc.; 6 = Paper; 7 = Cardboard; 8 = Cloth, Clothing, Carpeting; 9 = Food Packaging; 10 Auto: A. Oil containers, B. Oil filters, Antifreeze containers, D. Body parts large >1 ft², E. Body parts small <1 ft²; 11 = Car batteries; 12 = Tires; 13 = Construction Debris: A. Bricks, B. Concrete, C. Lumber, D. Misc. (drywall, etc.); 14 = Appliances; 15 = Wooden pallets; 16 = Metal; 17= Shopping Carts; 18 = Toiletries/Drug containers; 19 = Sports equipment/ Toys; 20 = Miscellaneous

²=

No. of Items/100 ft	Verbal Ranking
0-10.0	None-Very Light
10.1-25.0	Light
25.1-50.0	Moderate
>= 50.1	High

*=COG generated site ID

Table 2 – Summary: COG Trash TMDL Monitoring for Montgomery County, 250 ft. Removal and Weights- September-October 2013, (N=5)

Site ID	Site Name	Sub-watershed	Length (ft)	Total Number of Items	Total Number of Plastic Bags/Pieces	Total Wet Weight of Plastic Bags/Pieces (lbs)*	Total Weight (lbs)	Weight (lbs) per 100 ft
SCSC314	Carroll Avenue	Sligo Creek	250	80	19	0.9	4.8	1.9
NWBP205	Bel Pre Creek	Northwest Branch	250	35	15	4.4	5.3	2.1
NWNW407D	Kemp Mill Rd	Northwest Branch	250	40	16	4.0	5.3	2.1
PBSA100	Stewart April Ln	Paint Branch	250	535	221	12.6	24.7	9.9
LPLP301A	Fairland Regional Park (central)	Little Paint Branch	250	15	6	1.2	5.2	2.1

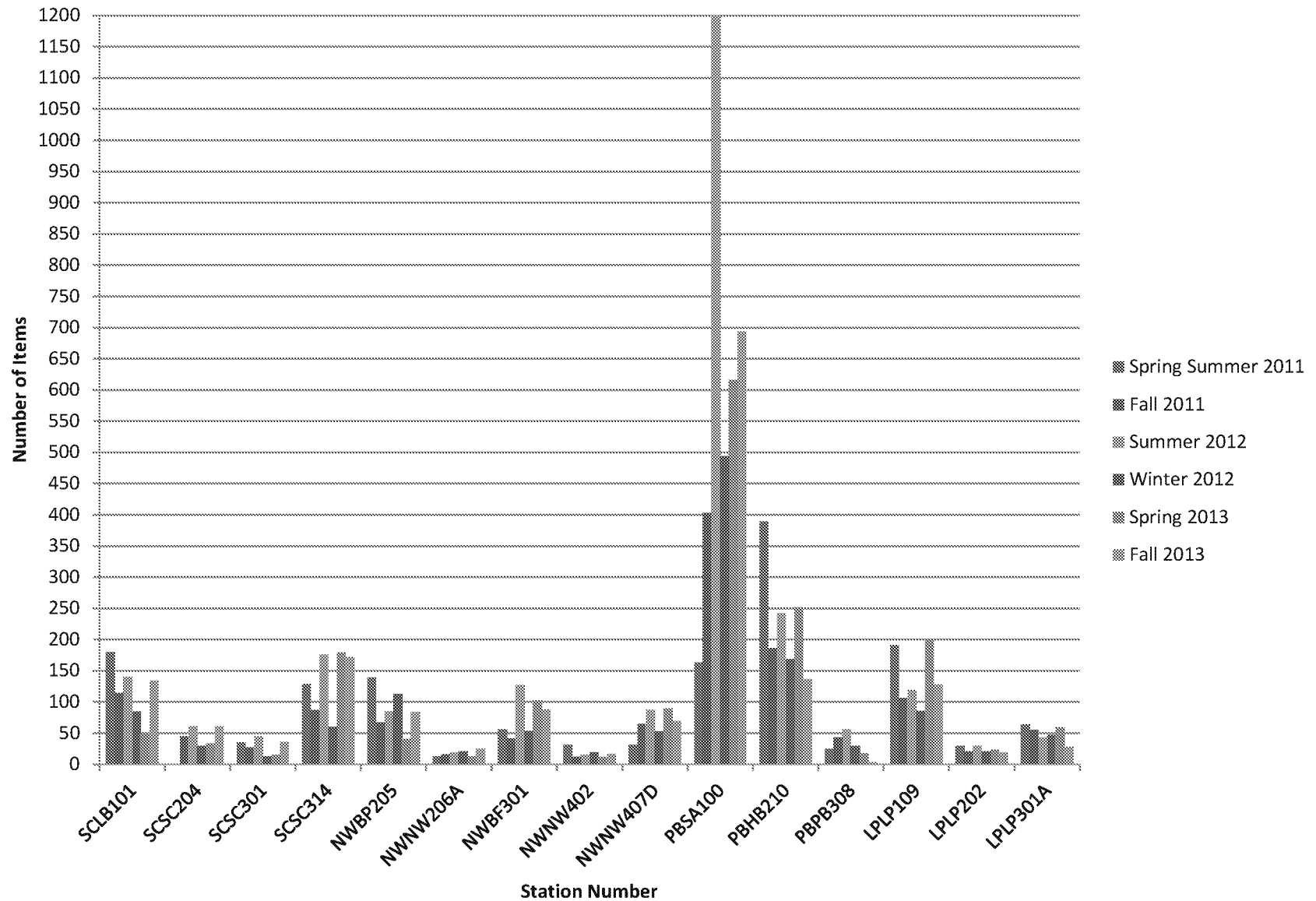
*-Wet weights and may include very small amount of sandy material

**-Weight is post 4/20/13 Stewart-April Lane stream clean up

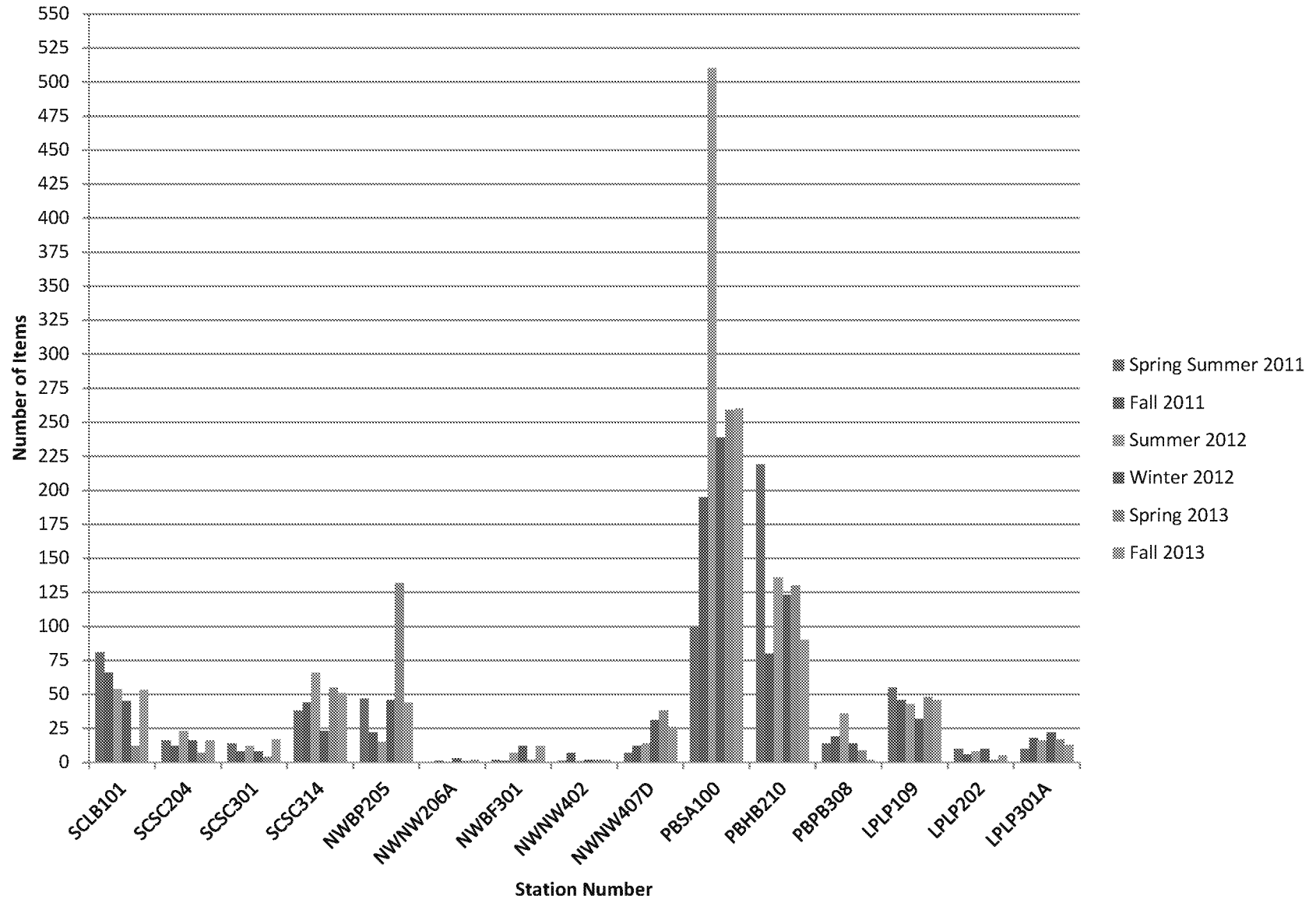
Table 3 – Approximate Monthly Trash Accumulation Rate-June 2013 to September/October 2013, (N=5)

Site ID	Site Name	Sub-watershed	Total Weight (lbs)	Accumulation Period (Months)	Monthly Trash Accumulation (lbs per Month)
SCSC314	Carroll Avenue	Sligo Creek	4.8	4	1.2
NWBP205	Bel Pre Creek	Northwest Branch	5.3		1.3
NWNW407D	Kemp Mill Rd	Northwest Branch	5.3		1.3
PBSA100	Stewart April Ln	Paint Branch	24.7		6.2
LPLP301A	Fairland Regional Park (central)	Little Paint Branch	5.2		1.3

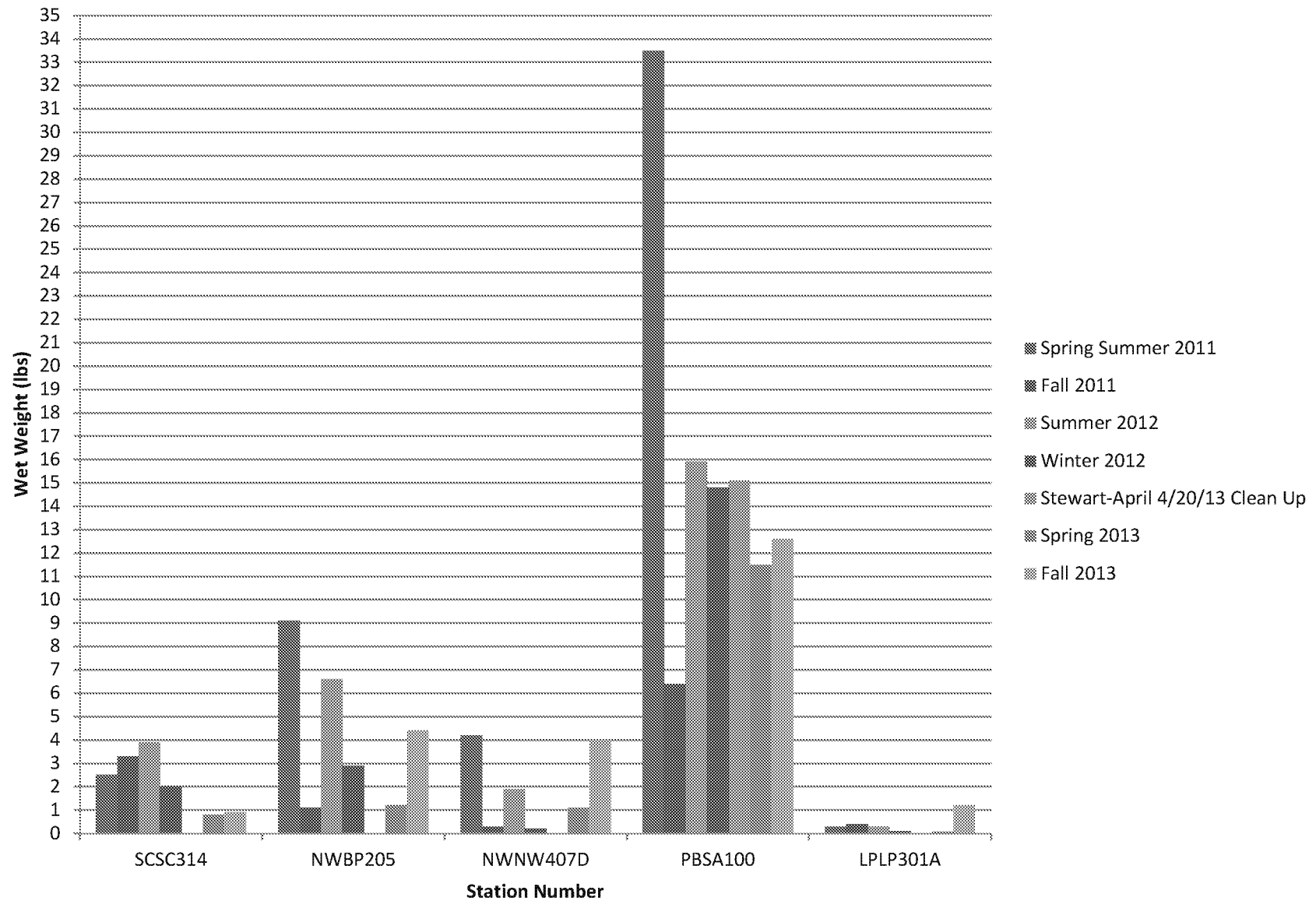
Summary: Total Number of Trash Items for 500 ft Count Sites, 2011-2013



Summary: Total Number of Plastic Bags/Pieces for 500 ft Count Sites, 2011-2013

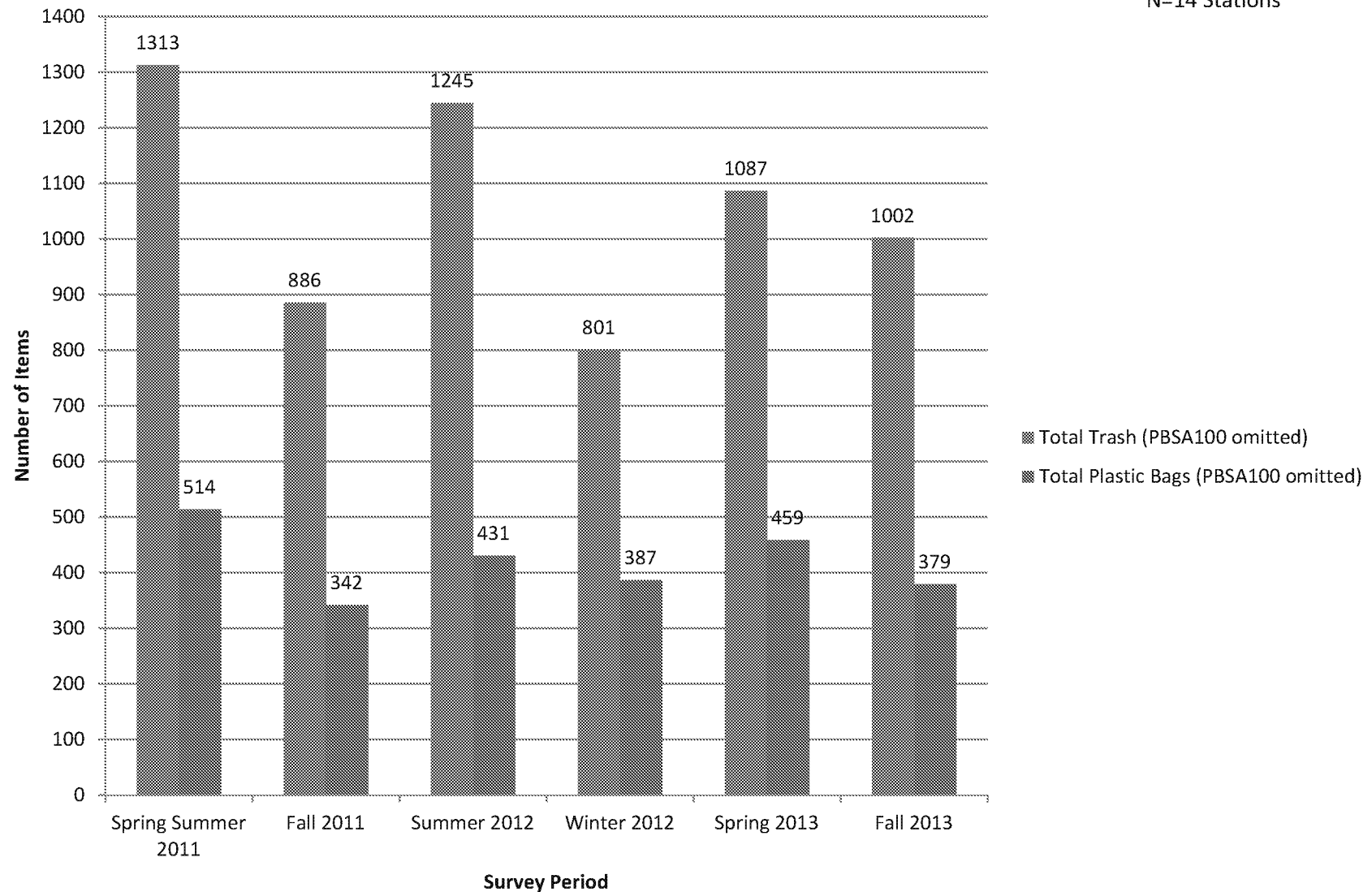


Summary: Total Wet Weight (lbs) of Plastic Bag/Pieces for 250 ft Trash Removal Sites, 2011-2013

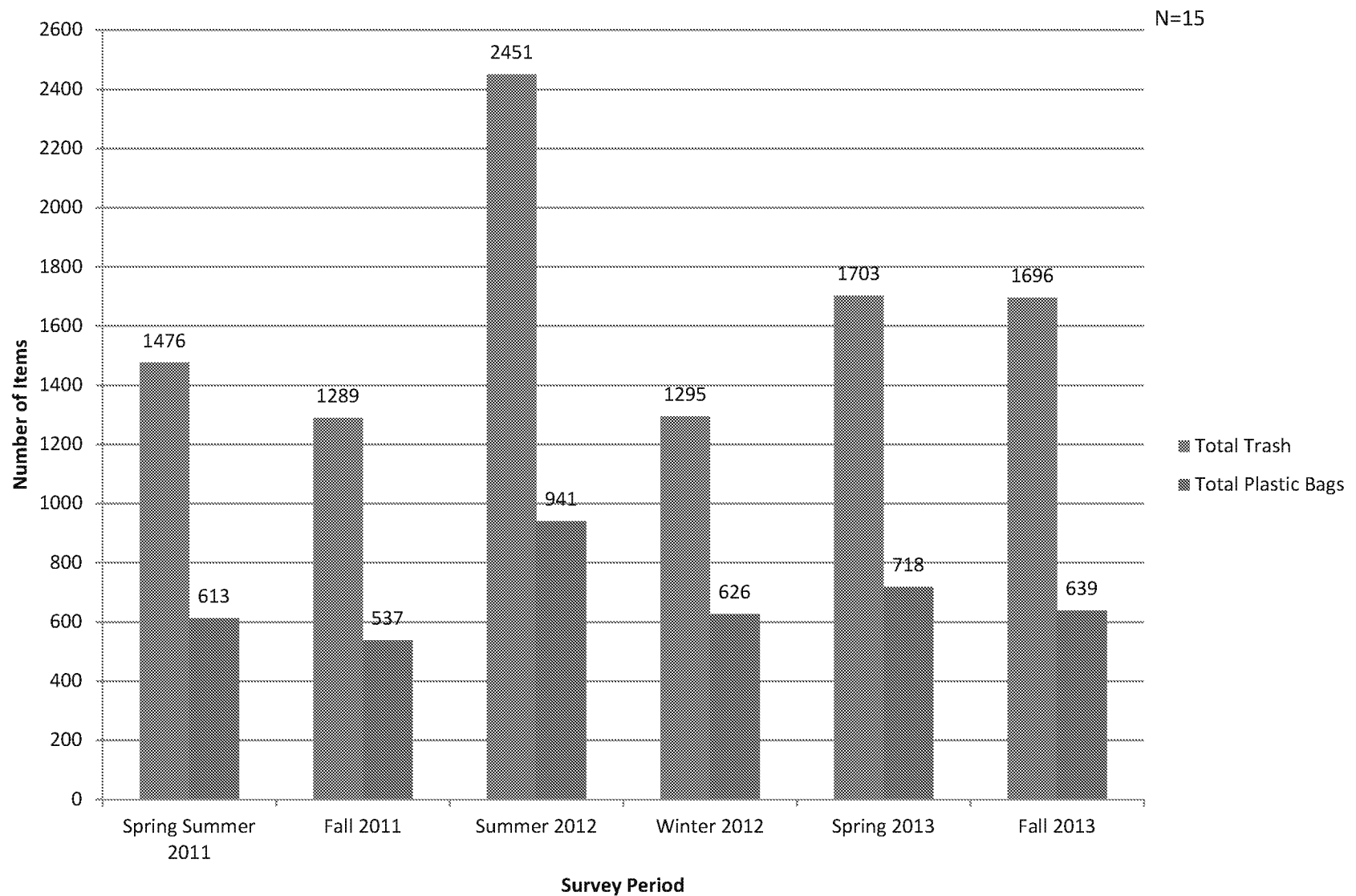


Summary: Combined Total Number of Plastic Bags/Pieces and Total Number of Items, 2011-2013 (PBSA100 Omitted)

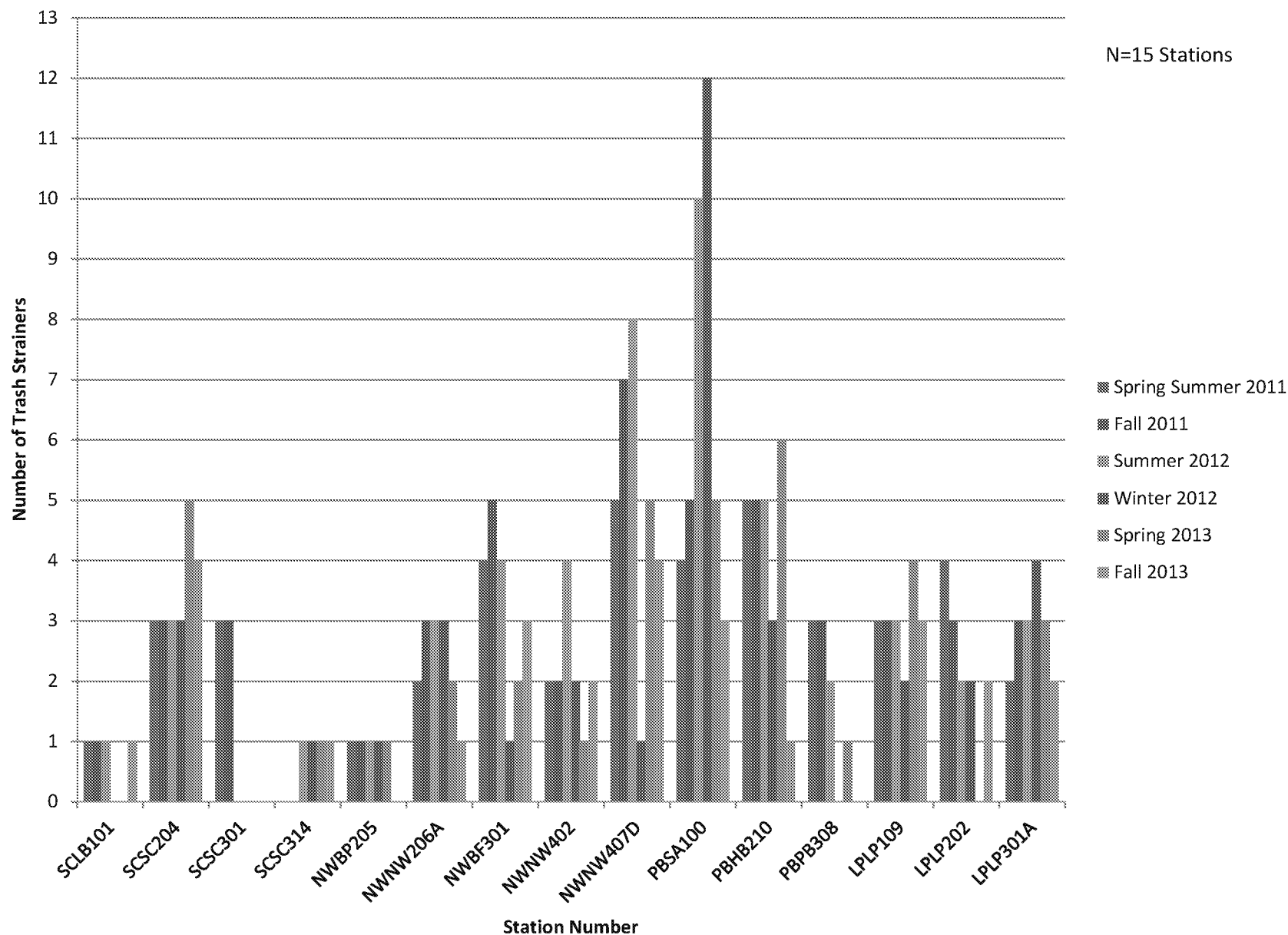
N=14 Stations



Summary: Combined Total Number of Plastic Bags/Pieces and Total Number of Items, 2011-2013 (PBSA100 Included)



Summary: Number of Trash 'Strainers', 2011-2013*



*-Natural or anthropogenic features such as log/debris dams, large protruding tree roots and rootwads, gabion baskets, large appliances, shopping carts, etc

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Montgomery County: Trash TMDL Monitoring Technical Memorandum (2011 - 2013)



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Project Background

Per the approved September 2010 Anacostia Watershed Trash TMDL, Montgomery County (the County) is required by MDE/EPA to annually remove or prevent hundreds of tons of trash from entering its tributary streams to the Anacostia River. In order to accomplish this challenging task, it is critical that the County annually assess and estimate both stream and land-based trash levels to provide guidance for cost-effective litter reduction measures. Note that these efforts are specifically focused on litter reduction rather than trash management.

Montgomery County Department of Environmental Protection (MCDEP) contracted with MWCOG to continue monitoring stream trash levels, quantifying land-based trash levels, and identifying existing major trash hot spots. Identification of trash sources and hot spots will further enable the County to specifically tailor trash education and outreach programs and better direct limited trash reduction resources to where they are most needed. The proposed monitoring is critical for assessing the effectiveness of both trash reduction and pollution prevention measures and initiatives.

As such, five major tasks were completed for this two-year project and are as follows:

- Task 1: Annual Stream-Level Trash Monitoring (Photos 1 and 2);
- Task 2: Annual Land-Based Trash Surveying*;
- Task 3: Survey of Trash Reduction-Related Efforts by Apartment and Commercial Shopping Center Management Firms;
- Task 4: Lower Rock Creek Tributaries Trash Surveying (Photo 3), and
- Task 5: Technical Memorandum

This technical memorandum will highlight Tasks 1-4 descriptions and their summary findings. Separate appendix documents have been provided for detailed task and data summary information.

*In lieu of completing a 2nd year windshield and walking trash survey, an additional early fall 2013 stream-level trash monitoring was completed for the 15 stream sites.



Photo 1. Stream trash monitoring at a trash strainer location



Photo 2. COG staff categorizing and weighing stream trash



Photo 3. COG staff (former) performing a trash trap catching device candidate site evaluation.

Task 1: Annual Stream-Level Trash Monitoring

Under this sub-task, COG employed the Anacostia tributary trash surveying protocol, using the MDE-approved field data sheet, to catalogue trash in 15 stream sites (Figure 1; Appendix 1). This instream trash survey was performed six times (generally late spring and late summer/fall seasons) beginning in August 2011 through September 2013. At each site, the total number of trash items within a 500 foot long stream reach was recorded and catalogued according to the 20 MDE trash category types. Table 1 represents the 1998 Anacostia Trash Reduction Workgroup's (ATRW) stream trash survey index, which provides a verbal ranking for the number of trash items per hundred feet range.

With the exception of the Paint Branch, Stewart April Lane site (herein referred to as PBSA100), the 2011-2013 trash monitoring station network are the same stations monitored in the 2008-2009 Anacostia trash TMDL baseline monitoring effort (MWCOG, 2009 and MDE, 2010). The PBSA100 site is a County trash reduction focus catchment area and is deemed as a priority for trash monitoring. Therefore, this site was added in 2011 and the LPLP205 site was omitted from the 2011-2013 survey period.

In addition to cataloguing the trash, at five of the 15 sites, COG removed and weighed trash items from the upstream 250 feet of the 500 foot long survey reach. In doing so at these 'pick sites', COG generated a reasonable estimate of instream trash accumulation/loading rates between survey periods. Also, in keeping with the 2008-9 survey methodology, precipitation data were obtained from the two nearest weather stations. These were the Reagan National Airport (DCA) and the USDA Beltsville Agricultural Research Center (BARC). The reader is referred to Appendix 1 for stream-by-stream top trash item comparisons as well as photographic documentation of representative trash levels.

Table 1. Anacostia Trash Reduction Workgroup's Stream Trash Survey Index

Trash Index	
Verbal Ranking	No. Items/100 ft.
None - Very Light	0 - 10.0
Light	10.1 - 25.0
Moderate	25.1 - 50.0
High	50.1 - 100.0

Summary of Findings

- In comparison to the 2008-2009 period, the 2011 -2013 site trash levels were generally lower, with seven stations (SCSC204, NWBP205, NWBF301, NWNW407D, PBHB210, PBPB308 and LPLP301A) decreasing in their respective mean trash verbal rating. The only increase was observed at station LPLP109.
- As seen in Figure 4, each site's mean verbal trash rating for the 2008-2009 and 2011-2013 survey periods is summarized:
 1. Seven sites = None - Very Light,
 2. Four sites = Light,
 3. Three sites = Moderate; and
 4. One site = High (PBSA100 - surveyed in 2011-2013 period only).
- In 2011-2013, a total of 10,385 trash items and 209 strainers were counted in six surveys (Table 2). Across four surveys in 2008-2009, 6,693 trash items and 476 strainers were counted (Table 3). 'Strainers' are natural or anthropogenic features such as log/debris dams, large protruding tree roots or rootwads, gabion baskets, large appliances, shopping carts, etc. Strainers effectively capture and temporarily retain trash, particularly floatables.
- Figure 5 shows the percent of total items for the top five trash categories for the 2008-2009 and 2011-2013 survey periods. Plastic bags, food packaging, plastic bottles, Styrofoam and construction debris remain the top trash items observed in the 2011-2013 period. Interestingly, the proportions

of counts of plastic bags and food packaging increased from the 2008-2009 surveys to the 2011-2013 surveys.

- Figure 6 shows the total count for the top five trash categories for 2008/2009 through 2013. There is a general decreasing trend for plastic bag, plastic bottle and Styrofoam trash categories. (It should be noted that the LPLP205 and PBSA100 data were not included since these sites were not surveyed during both the 2008-2009 and 2011-2013 periods.)
- Figure 7 summarizes the plastic bag count for the 2011-2013 surveys. A total of 3,961 plastic bags/ pieces were counted. The PBSA100 site had the highest plastic bag counts with the highest single count (510) on the July 2012 survey.
- As previously mentioned, PBSA100 is in a County trash reduction focus catchment area. As such, the County, along with Eyes of Paint Branch and others sponsored a April 2013 stream cleanup. Volunteers from the event removed 58 tires and approximately 52 pounds of litter. Fifteen pounds of this litter consisted of plastic bags, and about 1.5 pounds were plastic bottles. Additional community-based litter reduction activities are planned to address this 'hot spot' specifically.
- Table 4 shows the monthly trash accumulation rate by weight for the five 'pick sites'. The highest mean rate (5.7 pounds per month) was observed at the PBSA100 site. The lowest was observed at the Fairland Regional Park Site (LPLP301A). The PBSA100 site land use/ land cover is predominantly commercial and medium to high density residential while, the Fairland Regional Park site is predominantly forest, open space with fewer areas of commercial and medium density residential.

Figure 1. Montgomery County Anacostia Tributary Trash Monitoring Station Network (15 sites)

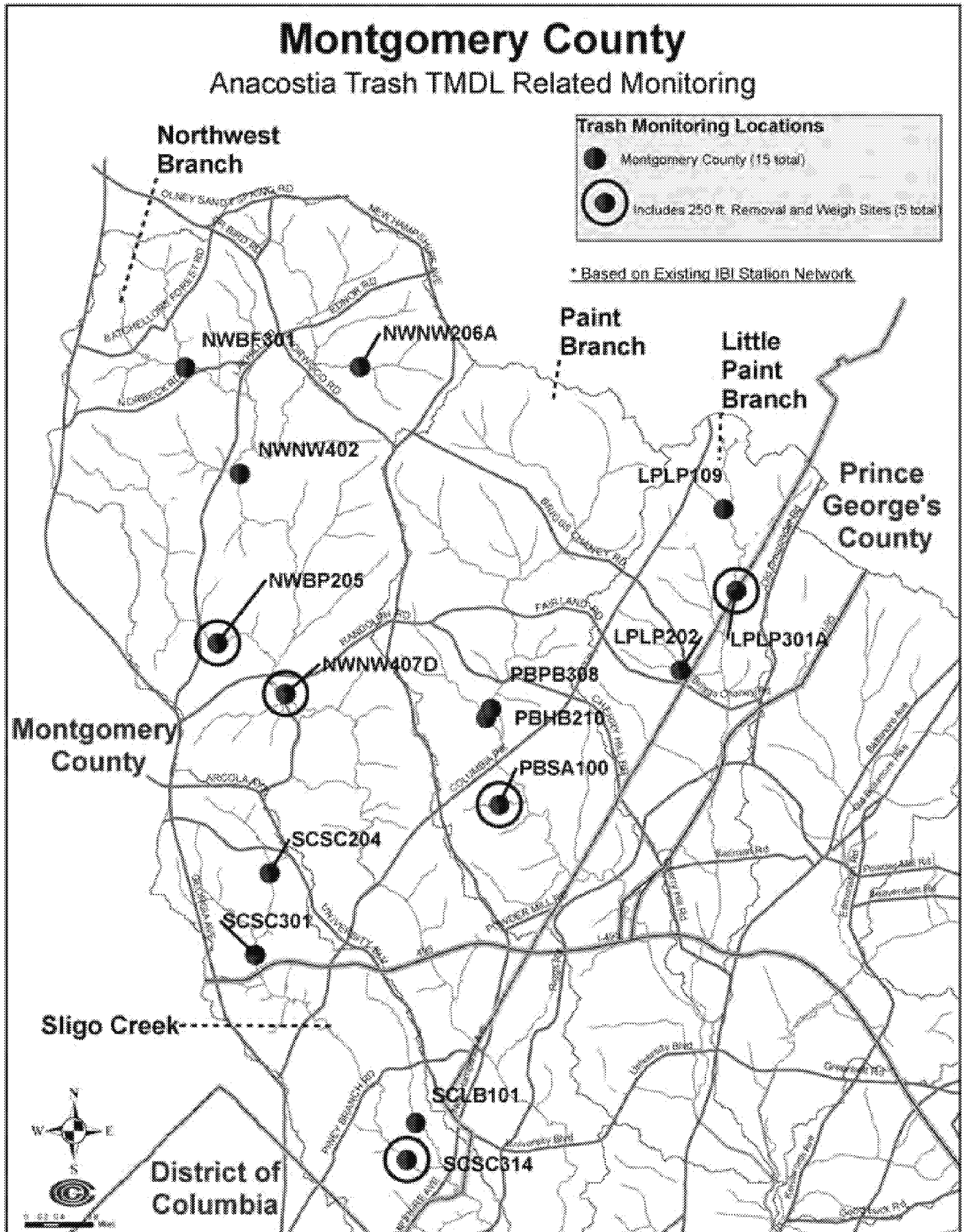


Figure 2. Monthly Rainfall Data Summary May 2011 - December 2013 (32 month period)

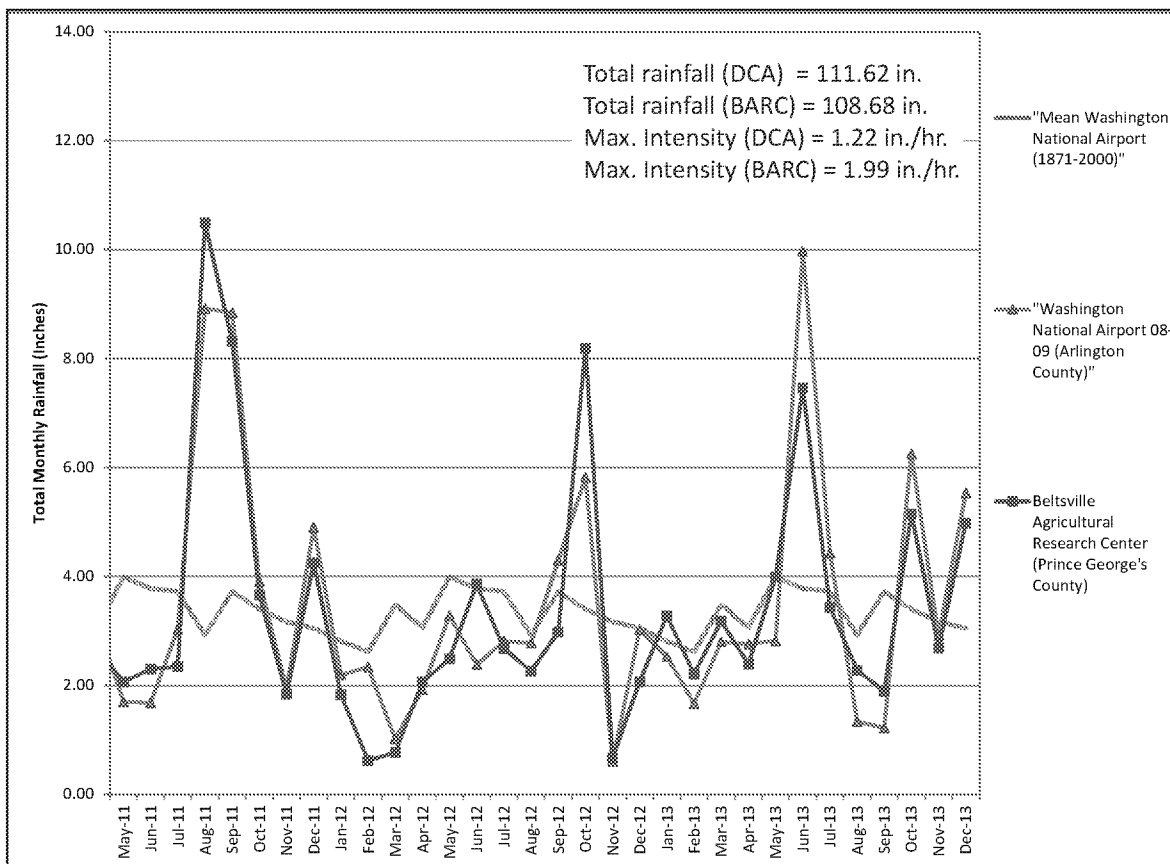


Figure 3. Monthly Rainfall Data Summary May 2008 - July 2009 (15 month period)

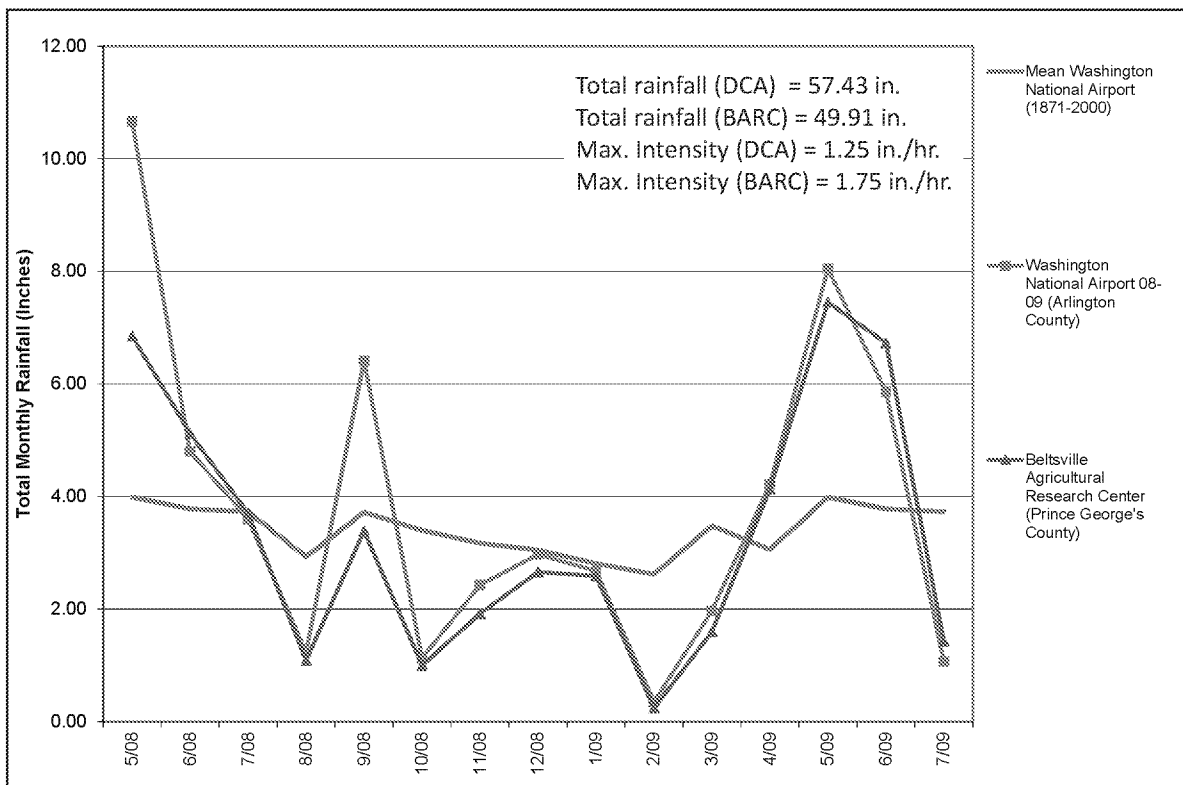


Figure 4. Station Trash Level Rating for Mean Items per 100 Feet (2008 -2009 and 2011-2013)

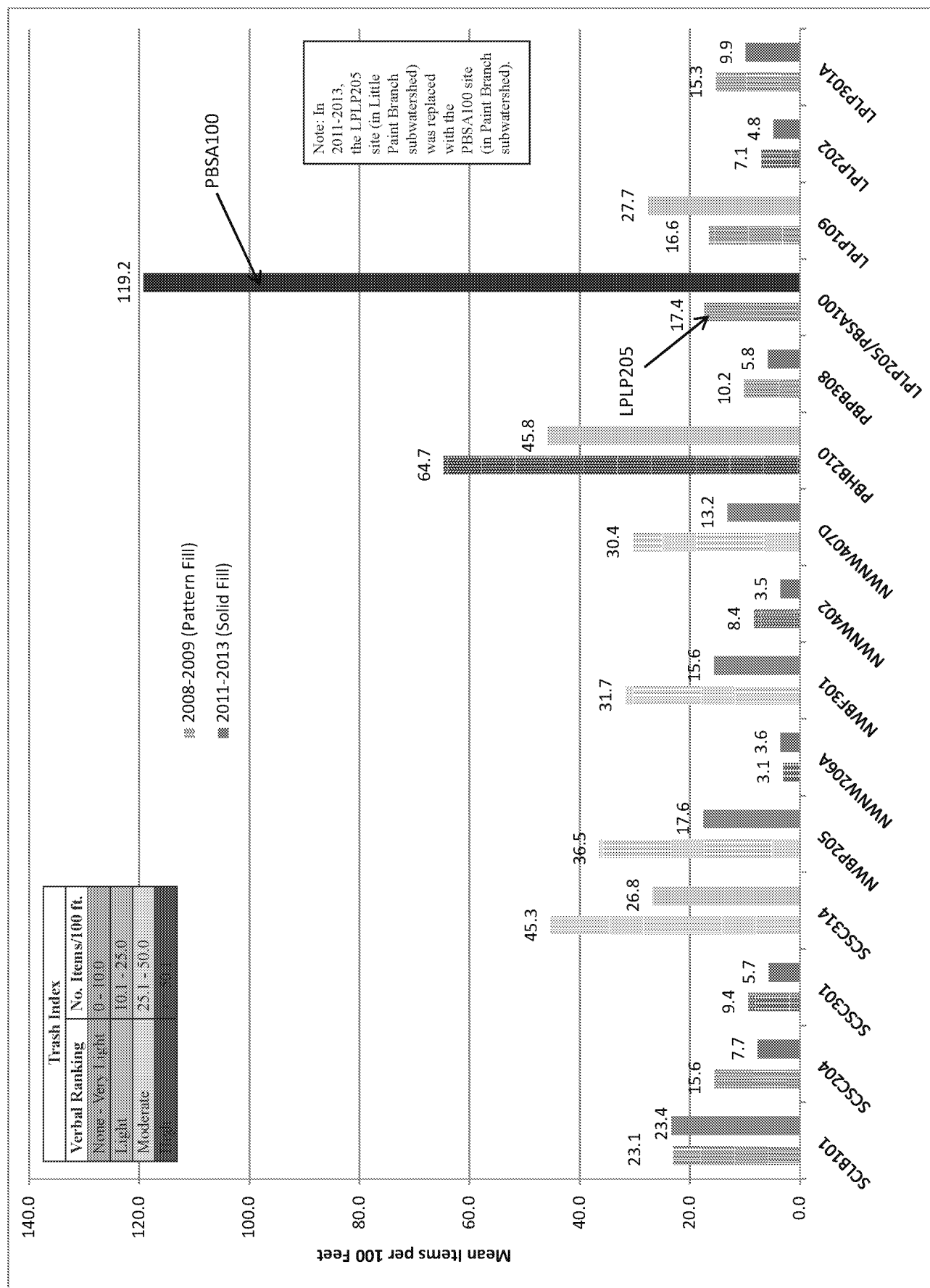


Table 2. Stream Survey Sampling Results 2011 - 2013 (N=6)

Site Name and Location	Site ID	Drainage Area (mi ²)	Stream Order	Total Number of Trash Items	Mean No. of Trash Items Per 100ft ¹	ARTW Verbal Trash Ranking ²	Top 6 Items ³		Total Number of Strainers
							Top 3 Items	Next 3 Items	
Sligo Creek (Long Branch)	SCLB101	0.99	1	701	26.8	Moderate	1,9,13a	20, (2,4 and 8 tied)	3
Sligo Creek (University Blvd)	SCSC204	0.99	2	231	23.4	Light	1,9,4	5,20,2	18
Sligo Creek (Forest Glen Road)	SCSC301	2.87	2	171	7.7	Very Light	1,9, (4 and 20 tied)	2,5,6	3
Sligo Creek (Carroll Ave)	SCSC314	7.17	2	803	5.7	Very Light	1,9,20	13a,4,2	4
Northwest Branch (Batchellors Run)	NWBF301	2.78	2	469	17.6	Light	16,13a,20	1,8,13b	15
Northwest Branch (Bryants Nursery Tributary)	NWNW206A	1.35	2	107	3.6	Very Light	13c,16c,13a	20,1, (4,5 and 8 tied)	12
Northwest Branch (Layhill Park)	NWNW402	12.09	3	106	15.6	Light	2,1,19	5,20,8	11
Northwest Branch (Bel Pre Creek)	NWBP205	3.74	2	620	3.5	Very Light	1,2,9	5,4,20	4
Northwest Branch (Kemp Mill Rd)	NWNW407D	21.19	3	396	13.2	Light	1,2,4	9,13c,5	25
Paint Branch (Stewart April Ln)	PBSA100	0.34	1	3,960	119.2	High	1,9,2	5,20,4	45
Paint Branch (Valley Mill Park)	PBPB308	9.23	3	175	45.8	Moderate	1,9,2	4, (5,8 and 20 tied)	6
Paint Branch (Hollywood Branch)	PBHB210	1.59	2	1,375	5.8	Very Light	1,9,2	20,5,4	20
Little Paint Branch (Fairland Pk North)	LPLP109	0.45	1	831	27.7	Moderate	1,2,9	5,4,20	15
Little Paint Branch (Fairland Pk Central)	LPLP301A	2.22	2	296	4.8	Very Light	1,2,9	2,13c,19	15
Little Paint Branch (Tanglewood Tributary)	LPLP202	0.92	2	144	9.9	Very Light	1,9,13c	2,12,20	13

¹ Mean of six survey seasons: N = 6

² 1998 ATRW Trash Index - Verbal Ranking = No. Items/100 ft: None - Very Light = 0 - 10.0; Light = 10.1 - 25.0; Moderate = 25.1 - 50.0; and High = >= 50.1

³ Trash Item Categories:

1) Plastic Bags 2) Plastic Bottles; 3) Glass Bottles; 4) Aluminum Cans; 5) Styrofoam (cups, packaging etc.); 6) Paper (newspaper, magazines, etc.); 7) Cardboard; 8) Cloth/Clothing/Carpeting; 9) Food Packaging; 10) Auto (a) Oil Quart Containers; b) Oil Filters Antifreeze; c) Containers d) Body Parts Large >1ft²; and e) Body Parts Small <1ft²; 11) Car Batteries; 12) Tires (Cars, Truck); 13) Construction Debris: (a) Bricks (>1/2 brick); b) Concrete; c) Lumber; and d) Misc. (e.g. dry wall, etc)); 14. Appliances; 15) Wooden Pallets; 16) Metal (Drums, Cans, Pipes, etc.); 17) Shopping Carts; 18) Toiletries/Drug Containers; 19) Sports Equipment/Toys; and 20) Miscellaneous.

Note: The site LPLP205 was replaced with the site PBSA100 for the 2011-2013 surveys.

Table 3. Stream Survey Sampling Results 2008-2009 (N=4)

Site Name and Location	Site ID	Drainage Area (mi ²)	Stream Order	Total Number of Trash Items	Mean No. of Trash Items Per 100ft ¹	ARTW Verbal Trash Ranking	Top 6 Items ³		Total Number of Strainers
							Top 3 Items	Next 3 Items	
Sligo Creek (Long Branch)	SCLB101	0.99	1	462	23.1	Light	1,13,9	4,5,6	4
Sligo Creek (University Blvd)	SCSC204	0.99	2	311	15.6	Light	1,9,5	2,13,20	8
Sligo Creek (Forest Glen Road)	SCSC301	2.87	2	188	9.4	V. Light	1,9,5	2,13,20	3
Sligo Creek (Carroll Ave)	SCSC314	7.17	2	906	45.3	Moderate	13,9,4	20,19,16	4
Northwest Branch (Batchellors Run)	NWBF301	2.78	2	634	31.7	Moderate	13,16,1	8,20,3	7
Northwest Branch (Bryants Nursery Tributary)	NWNW206A	1.35	2	62	3.1	V. Light	13,16,1	20,3,4	5
Northwest Branch (Layhill Park)	NWNW402	12.09	3	168	8.4	V. Light	13,1,19	2,9,3	7
Northwest Branch (Bel Pre Creek)	NWBP205	3.74	2	730	36.5	Moderate	1,2,5	9,20,19	9
Northwest Branch (Kemp Mill Rd)	NWNW407D	21.19	3	607	30.4	Moderate	1,2,9	4,5,20	13
Paint Branch (Valley Mill Park)	PBPB308	9.23	3	204	10.2	Light	1,2,5	9,20,8	9
Paint Branch (Hollywood Branch)	PBHB210	1.59	2	1,294	64.7	Moderate	1,2,5	9,4,19	12
Little Paint Branch (Fairland Pk North)	LPLP109	0.45	1	331	16.6	Light	1,5,2	9,8,4	9
Little Paint Branch (Fairland Pk Central)	LPLP301A	2.22	2	306	15.3	Light	5,1,2	9,4,11	11
Little Paint Branch (S of Greencastle Rd)	LPLP205	1.49	2	348	17.4	Light	1,5,2	9,8,16	10
Little Paint Branch (Briggs Chaney Rd)	LPLP202	0.92	2	142	7.1	V. Light	1,9,5	5,19,8	8

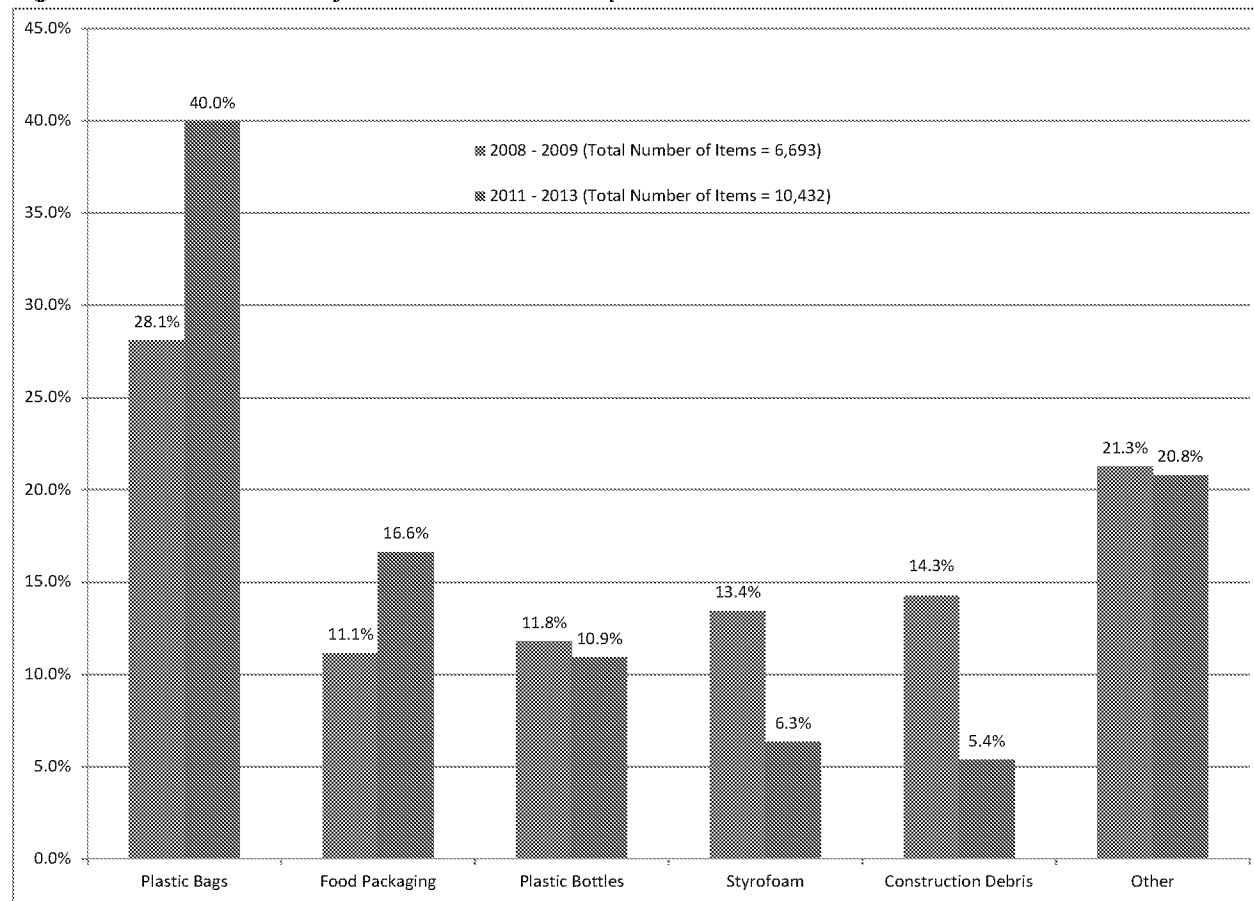
¹ Mean of four survey seasons: N = 4

² 1998 ATRW Trash Index - Verbal Ranking = No. Items/100 ft: None - Very Light = 0 - 10.0; Light = 10.1 - 25.0; Moderate = 25.1 - 50.0; and High = >= 50.1

³ Trash Item Categories:

1) Plastic Bags 2) Plastic Bottles; 3) Glass Bottles; 4) Aluminum Cans; 5) Styrofoam (cups, packaging etc.); 6) Paper (newspaper, magazines, etc.); 7) Cardboard; 8) Cloth/Clothing/Carpeting; 9) Food Packaging; 10) Auto (a) Oil Quart Containers; b) Oil Filters Antifreeze; c) Containers d) Body Parts Large >1ft²; and e) Body Parts Small <1ft²; 11) Car Batteries; 12) Tires (Cars, Truck); 13) Construction Debris: (a) Bricks (>1/2 brick); b) Concrete; c) Lumber; and d) Misc. (e.g. dry wall, etc)); 14. Appliances; 15) Wooden Pallets; 16) Metal (Drums, Cans, Pipes, etc.); 17) Shopping Carts; 18) Toiletries/Drug Containers; 19) Sports Equipment/Toys; and 20) Miscellaneous.

Figure 5. Stream Summary - Percent Total of Top Five Trash Items for 2008- 2009 and 2011-2013 Surveys



Note: 2008-2009 surveys do not include PBSA100, which is a litter 'hot spot'

Figure 6. Stream Summary - Top Five Trash Items* for 2008- 2009, 2011, 2012, and 2013

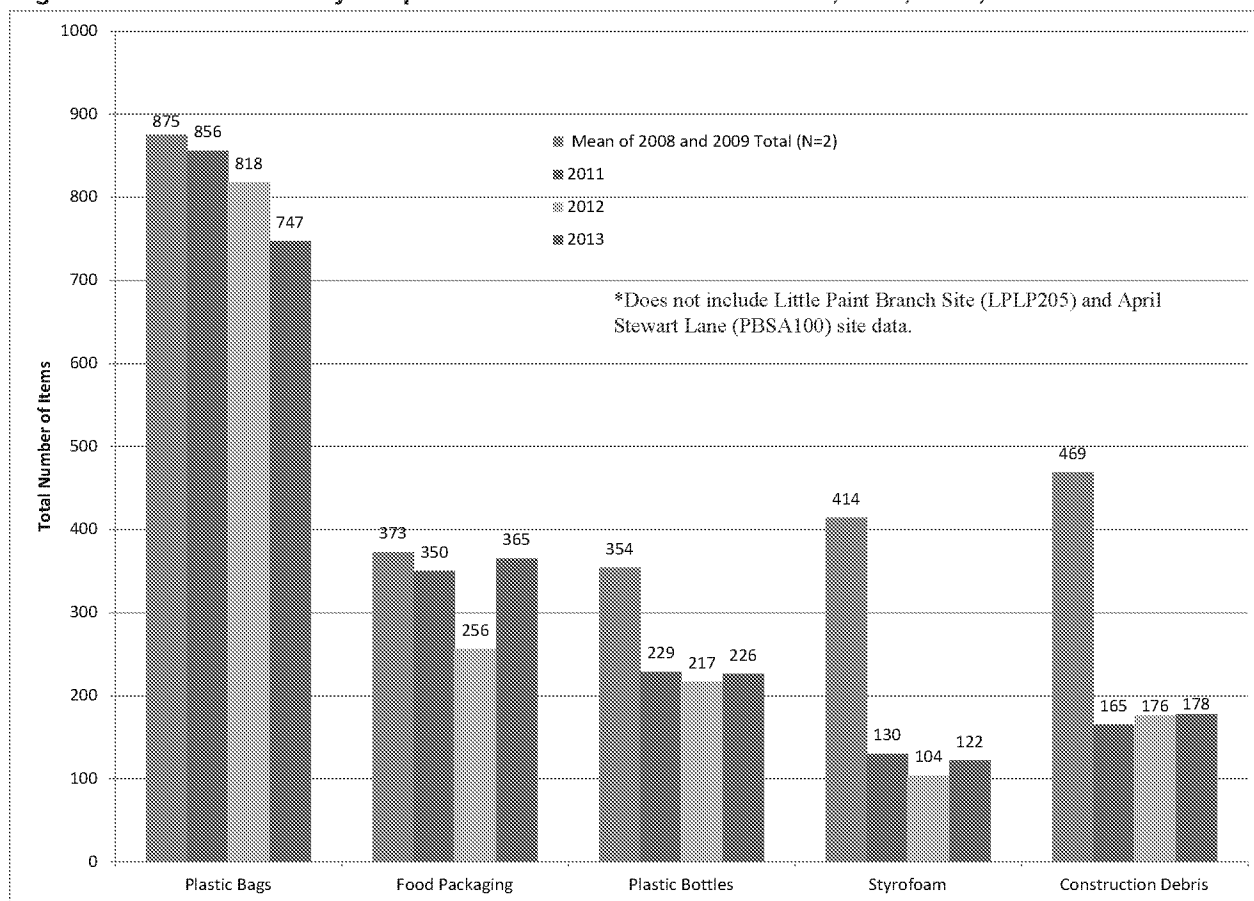


Figure 7. Stream Summary - Total Number of Plastic Bags (2011-2013)

Summary: Total Number of Plastic Bags/Pieces for 500 ft Count Sites, 2011-2013

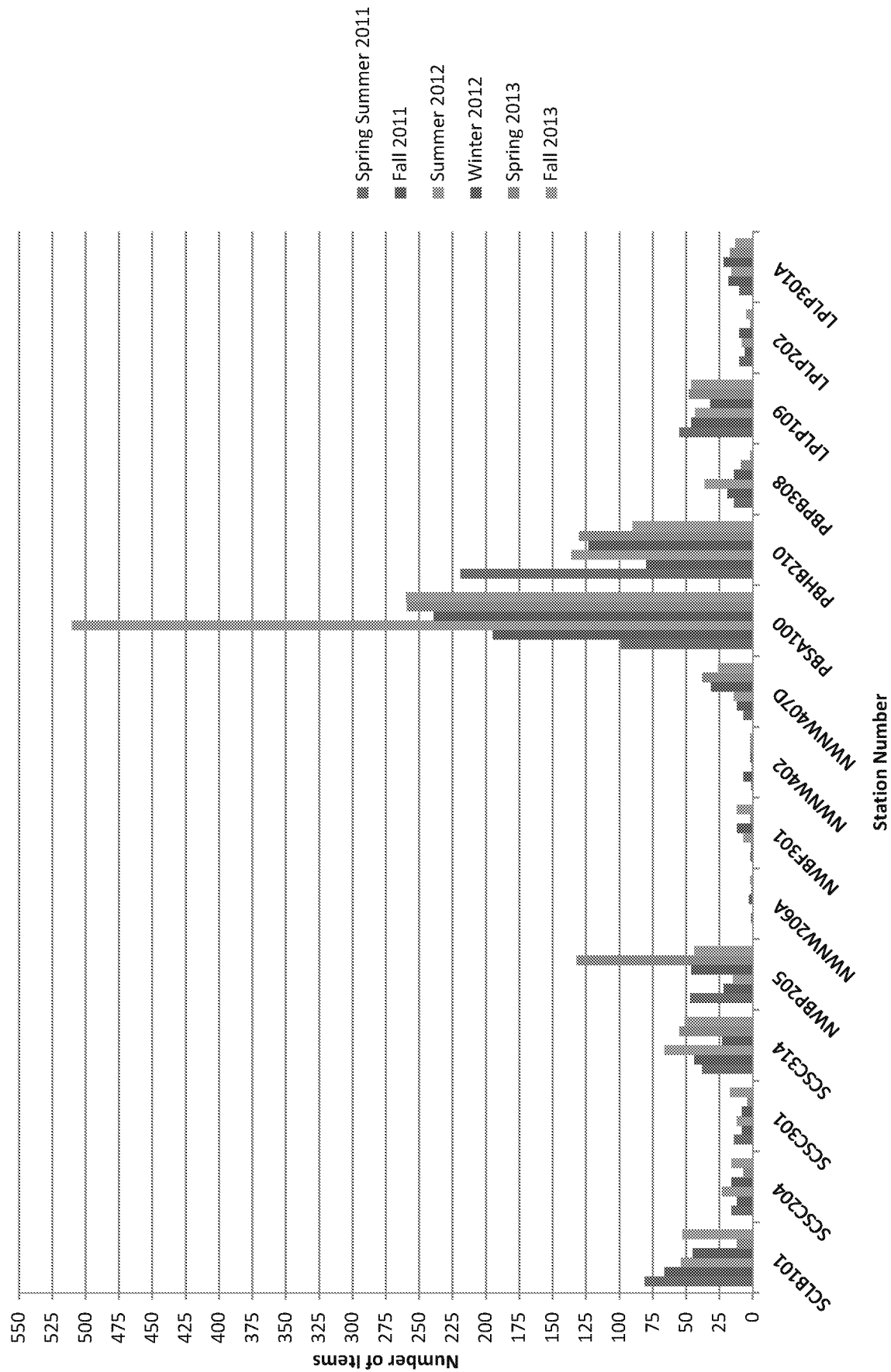


Table 4. Average Monthly Trash Accumulation (lbs per Month)

Sub-Watershed	Site Name	Site ID	Monthly Trash Accumulation (lbs per Month)						Mean Monthly Accumulation Rate	Mean Annual Accumulation Rate (lbs per Year)
			Summer 2011	Fall 2011	Summer 2012	Fall 2012	Summer 2013	Fall 2013		
Sligo Creek	Carroll Avenue	SCSC314	1.0	3.3	1.1	1.0	1.2	1.2	1.5	17.6
Northwest Branch	Bel Pre Creek	NWBP205	6.0	1.1	1.3	1.6	0.9	1.3	2.0	24.4
Northwest Branch	Kemp Mill Road	NWNW407D	2.2	1.2	1.6	0.3	1.0	1.3	1.3	15.2
Paint Branch	Stewart April Lane	PBSA100	9.1	4.4	3.8	5.6	5.3	6.2	5.7	68.8
Little Paint Branch	Fairland Regional Park (Central)	LPLP301A	1.6	1.1	0.2	0.1	0.3	1.3	0.8	9.2

Task 2: Annual Land-Based Trash Surveying

Under this sub-task, COG developed, in February 2012, a semi-quantitative 18-page, ‘windshield’ (i.e., driving) trash/litter surveying protocol to conduct along roads with posted speed limits at 45 MPH or less.

This land-based protocol, which comprised of a driving and a walk surveying component, was field tested and refined during the February to September 2012 time frame. A final draft of the protocol was then completed and submitted to the County. By the end of January 2013, staff had successfully completed the survey for 232 road sites or approximately 129 miles of road length. In addition, of the 232 sites surveyed, 73 complimentary walk surveys were completed to provide additional quantitative trash-related data (Figure 8). It should be noted that COG staff focused on medium to high density, along with commercial and industrial, land use areas to conduct this survey protocol. Table 5 represents the ‘windshield’ trash survey index, which provides a verbal ranking for the number of trash items per hundred feet range. Table 6 summarizes the County road miles surveyed for four Anacostia subwatersheds (i.e., Sligo Creek, Northwest Branch, Paint Branch, and Little Paint Branch).

Table 5. Anacostia ‘Windshield’ Trash Survey Index

Range (No. Items/100 ft)*	Verbal Ranking	Color Code
0-5.0	None-Very Light	Blue
5.1-10.0	Light	Green
10.1-20.0	Moderate	Yellow
>= 20.1	High	Red
*Note: Range levels modified to account for under counting associated with higher vehicular speed		

The data from the aforementioned survey were incorporated into the Anacostia trash-related GIS geodatabase. Using this spatial data format, maps were created to illustrate the land-based trash/litter conditions and hot spots. In addition, wherever available, existing County Adopt-A-Road locations were overlaid on the ‘windshield’ data so as to possibly relate the land-based trash condition to this trash/litter reduction program. The reader is referred to Appendix 2 for the April 2012 draft report and September 2012 update report.

Summary of Findings:

- Based on year 1 (February 2012 to January 2013) ‘windshield’ survey data, the majority of the County roads had ‘None-Very Light’ trash rating conditions (Figure 8). COG staff recommended not to conduct the following year 2 study. In addition, staff recommended not to perform the “volunteer-based” windshield surveying protocol training session(s) due to survey challenges and volunteer safety issues. County staff agreed with these COG recommendations.
- The ‘windshield’/driving surveyed length of roads ranged from 355 feet to 11,000 feet.
- As shown in Figure 8 and Table 6, the majority of the roads surveyed (i.e., 91% of the 232 sites surveyed) were rated ‘None-Very Light’. 21 road sites that were rated either ‘Light, Moderate, or High’ are located within the medium to high density residential, commercial/industrial land use areas.
- Of the three road sites that were rated as ‘Moderate’, two are located in the Northwest Branch along Quebec Terrace (Garden-style apartment area) and Ruatan Street (Medium/High density single family homes). The other site is in the Paint Branch subwatershed along Industrial Parkway.
- One site that was rated as ‘High’ is located along New Hampshire Avenue (not a County-maintained road) between Oakview Drive and Cottrell Terrace. (It should be noted that major roads such as New Hampshire Avenue were a challenge to survey because of high traffic volume and high vehicular speed.)
- For the ‘windshield’ survey portion, a total of 12,211 items were counted. However it was not possible to place the trash items in the 20 categories.
- For the walk survey portion, there were 1,676 total items counted. Of that total, the top three trash items were Paper, Food Packaging and Miscellaneous (Figure 9).

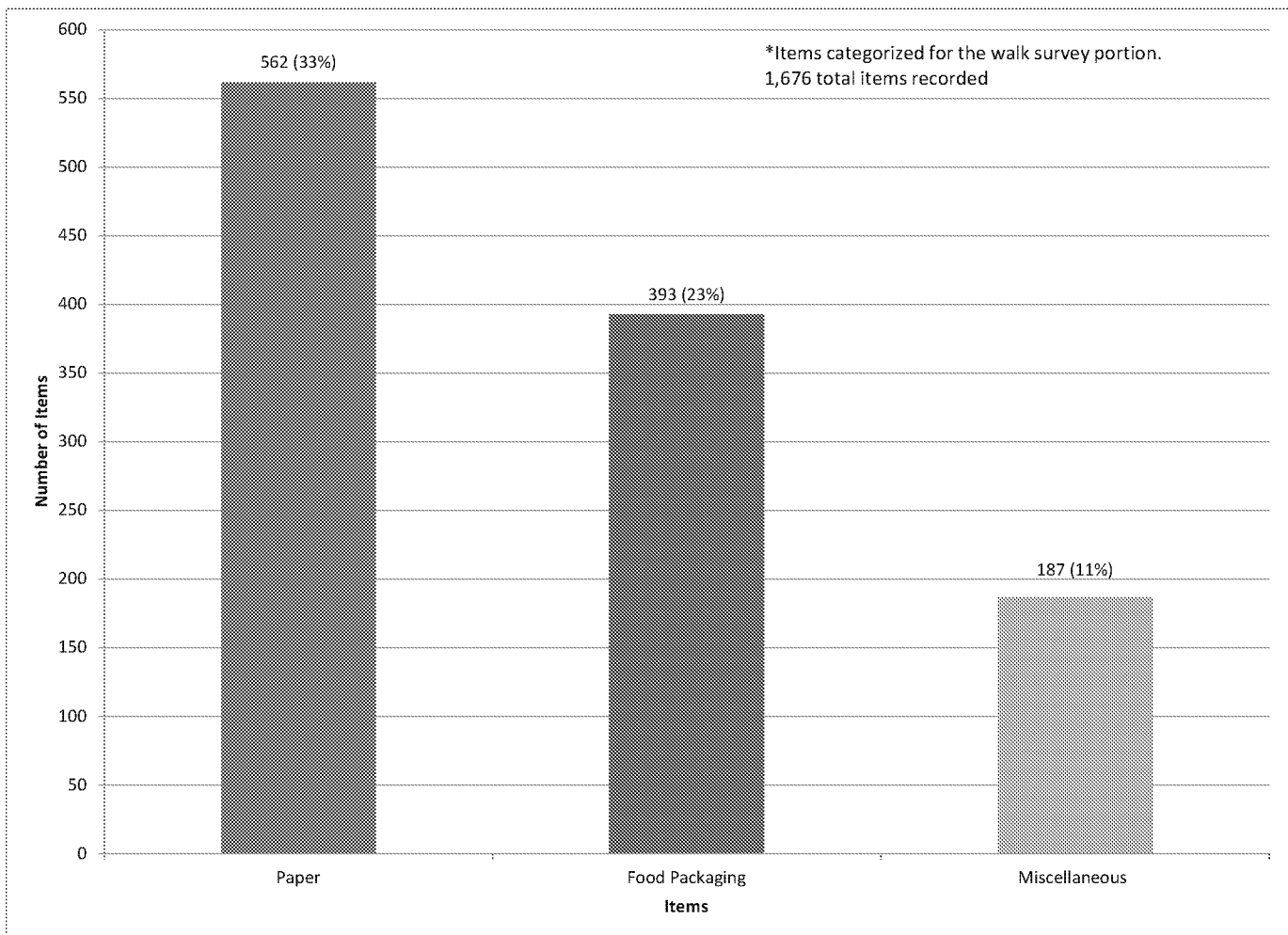
Figure 8. Summary - Montgomery County Windshield and Walking Survey Map



Table 6. Summary - Roads (Land-based) Surveyed Trash Rating

Subwatershed	Miles Surveyed	Number of Road Sites Surveyed	Road Sites Surveyed - Trash Verbal Rating				
			None	Very Light	Light	Moderate	High
1. Sligo Creek	43	76	0	73	3	0	0
2. Northwest Branch	50	92	0	78	11	2	1
3. Paint Branch	24	43	1	38	3	1	0
4. Little Paint Branch	12	21	0	21	0	0	0
Total	129	232	1	210	17	3	1

Figure 9. Summary - 300 Foot Walk Survey Top-Three Trash Items* (February 2012 to January 2013)



Task 3: Survey of Trash Reduction-Related Efforts by Apartment and Commercial Shopping Center Management Firms

Under this sub-task, COG solicited trash management and litter information from apartment and commercial shopping properties within the Anacostia watershed portion of the County (Figure 10). Under this survey task, COG was expected to: 1) obtain property owner and management firm contact information and enter it into a Microsoft Access/Excel trash reduction-related database; 2) where necessary, follow up the electronic survey with both phone interviews and “snail mail” surveys; and 3) conduct general parking lot/grounds trash level verification visits for all 10-12 major commercial shopping center sites, as well as for approximately 80-100 apartment properties. These site visits would include general trash level condition documentation.

In summer 2013, COG staff drafted a survey questionnaire (25 questions, created in SurveyMonkey) and a cover letter for each apartment and commercial properties (Appendix 3). After MCDEP review and approval, a coordinated two-step strategy was implemented to release the survey questionnaire. First, in the fall of 2013, the survey was released to 10 apartments within the White Oak tributary area so as to gauge overall the property management responsiveness. Both COG and MCDEP staff met with on-site managers to discuss the survey’s intention and to solicit participation. When only one survey was completed, COG and MCDEP staff conducted another round of in-person visits, which resulted in survey completion by 9 of the 10 apartment property managers.

With an original target of 80-100 apartment properties, COG requested a project scope revision to better reflect the increased effort needed to receive completed surveys. Approved by MCDEP in spring 2014, the revised scope of work reduced the number to 40-50 apartment properties to be contacted. It should be noted that the original target of 10-12 commercial properties remained unchanged.

Under the second step, using the County’s Division of Solid Waste’s list of apartment properties, COG targeted apartments in proximity to the stream trash monitoring sites. With MCDEP staff, COG then visited over 40 apartment properties (It should be noted that surveys were not distributed to nursing homes or condos properties that were included in the original list). Following these site visits, COG staff sent weekly reminder emails to all apartment managers to participate in the survey. This resulted in 23 total surveys completed by apartment property managers (Table 7); thirteen used the online survey and 10 completed paper copies. Table 9 highlights some of the survey responses. In addition to the cover letters and questionnaires, all 23 survey responses can be found in Appendix 3.

Following the apartment surveys, COG staff began contacting 16 targeted commercial shopping center property managers by phone and email to solicit survey participation. Limited COG and MCDEP staff visits were conducted (it should be noted that most commercial property management firms were not located on-site and were not within easy driving distance). For the 16 targeted commercial properties, 12 property managers agreed to participate in the survey. As of June 2014, COG has received completed surveys for 5 properties (Table 8). Table 10 highlights some of the survey responses. All 5 survey responses from the commercial property managers can be found in Appendix 3.

Summary of Findings - Apartment Property Survey Questionnaire

- As previously indicated, the staff effort to solicit survey responses was greater than anticipated. Yet this was the level of effort to achieve 23 participants from the apartment property management firms.
- COG identified and directly contacted 61 apartment properties; 23 participants (38%) completed the survey. It should be noted that not all survey participants (property managers) answered all 25 questions.

- Most apartment property managers recognized that there exists a litter problem on their properties and 14, 5, and 4 are the number of managers that rated their litter problem as Small, but Manageable, Noticeable, and No Litter Problem, respectively. Through COG site visits, all the properties were generally in the Small, but Manageable category.
- Generally, the managers identified the litter problem areas in order from highest to lowest near the dumpster, the recycling containers and, around both the parking lot/garages and sidewalks.
- Sixteen managers responded that they actively contacted the residents to address the litter problem. Generally, the preferred communication pathway is a written notice to each apartment unit.
- There are at least seven properties that provide multilingual written notices regarding litter problems.
- Based on 19 responses, dedicated on-site maintenance staff provide trash/litter removal at a mean rate of 45.3 hours per week (ranges from 7 to 200 hours per week). It should be noted that larger properties have up to three full-time maintenance staff.
- Based on eight responses, the mean annual cost to remove litter from the property is roughly \$3,067 and ranges from approximately \$500 to \$30,000.
- Based on the 18 responses from question 24 (What suggestions or recommendations would you give a new property manager regarding litter control issues?), the majority of the managers highlighted that communicating and keeping residents informed is important. They also suggested that issuing monetary penalties is a successful approach to curb litter by residents.

Summary of Findings - Commercial Property Survey Questionnaire

- COG identified 16 commercial properties and directly contacted (via email, phone, and/or in-person visits) 12 property managers; 5 completed surveys were received.
- Most commercial property managers recognized that there exists a litter problem on their properties. Two rated their litter problem as Small, but Manageable and two rated their litter problem as Noticeable. Through COG site visits, most properties were generally in those two categories.
- Generally, the managers identified the litter problem areas in order from highest to lowest near the dumpsters, the recycling containers, street curbs, sidewalks, public trash containers, parking lots/garages, and near buildings.
- Surprisingly, 4 of 5 respondents have not contacted their tenants about the litter problem. In addition, 4 of 5 respondents indicated that they do not have posted signs throughout the property to discourage littering.
- Four of 5 respondents replied that they do have a problem with illegal dumping of trash. Three of five respondents indicated that they do not have signage on the property to discourage illegal dumping.
- Based on 4 responses, the mean annual cost for addressing illegal dumping is roughly \$2,600 and ranges from approximately \$500 to \$5,000.
- Four out of 5 respondents (80%) indicated that they were unsure if the Montgomery County carry-out bag tax has resulted in a decrease of litter on their property.

Figure 10. Montgomery County Apartment and Commercial Shopping Center Survey Locations

-Draft-

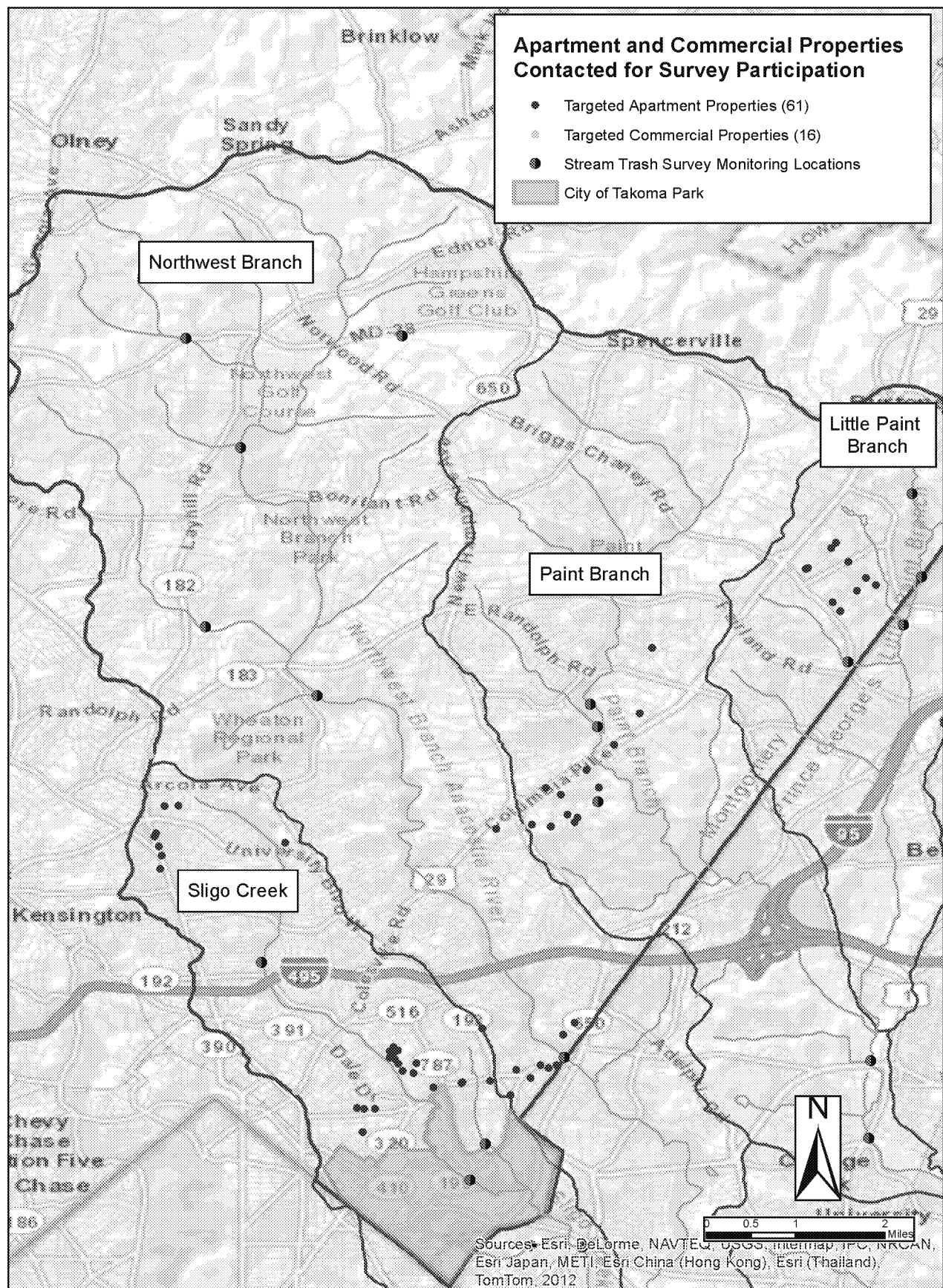


Table 7. Apartment Properties Contacted and Surveys Completed

Property Name	Address	Management Co.	Survey Completed
Sligo Creek			
100-102 Schuyler Road	100 Schuyler Road, Silver Spring MD	Lenkin Management Co., LLC	
Bucknell Apartments	11500 Bucknell Dr., Silver Spring MD 20902	Poretsky Building Group	
Courts of Madison	700 Sligo Ave., Silver Spring MD	The Donaldson Group	
Croydon Manor	104 Croydon Ct., Silver Spring MD	Horning Brothers	
Earle Manor Apartments	10820 Georgia Ave., Wheaton MD 20902	Zalco Realty, Inc.	
Flower Branch Apartments	8628 Piney Branch Rd., Silver Spring MD	Kay Management Co., Inc.	
Foxhall Apartments	8715 Piney Branch Rd., Silver Spring MD 20901	Commodore Mgmt. Co., Inc.	
Goodacre Apartments	8617 Piney Branch Rd., Silver Spring MD	Kay Management Co., Inc.	
Ken Mill Apartments	9119 Manchester Rd., Silver Spring MD	The Winston Group, LLC	
Manchester Manor Apartments	8401 Manchester Rd., Silver Spring MD 20901	HOC of MoCo	
MetroPointe Apartments	11175 Georgia Ave., Wheaton-Glenmont MD 20902	Bozzuto	
Park Wayne Apartments	2 Manchester Pl, Silver Spring MD 20901	Commodore Mgmt. Co., Inc.	✓
Parkside Terrace	506 Easley St. #T3, Silver Spring MD	Grady Management	
Pembroke Square Apartments	2315 Blueridge Ave., Silver Spring MD 20902	Equity Management	
Pine Ridge Apartments	8617 Piney Branch Rd., Silver Spring MD	Kay Management Co., Inc.	
Silver Spring House Apts.	555 Thayer Ave., Silver Spring MD	Dreyfuss Management	
Sligo Hills Apartments	9000 Manchester Rd., Silver Spring Md 20901	HOC of MoCo	
Sligo Park Hills Apartment	108 Schuyler Rd., Silver Spring MD 20901	Patner Properties	
Sligo Terrace Apartments	8800 Manchester Rd., Silver Spring MD 20901	Fitzgerald Properties	
Solaire Wheaton	10914 Georgia Ave., Silver Spring MD 20902	Washington Property Co.	✓
Stratford Terrace Apartments	9061 Manchester Rd., Silver Spring MD 20901	Stratford Terrace Apts., LLC	
Tanglewood Apartments	8902 Manchester Rd., Silver Spring MD 20901	HOC of MoCo	
Thayer Terrace	525 Thayer Ave., Silver Spring MD	Stellar Advisors Realty	
The Exchange at Wheaton	11215 Georgia Ave., Wheaton MD 20902	Foulger-Pratt	
The Flats at Wheaton Station	11101 Georgia Ave., Wheaton MD 20902	Borger	✓
The Warwick	1131 University Blvd. West, Silver Spring MD 20902	Greystar	
Wayne Manchester Towers Apartments	25 E. Wayne Ave., Silver Spring MD 20901	Kay Management Co., Inc.	✓
Wheaton House	10811 Georgia Ave., Wheaton MD 20902	Borger	
Total Contacted:		28	Total Completed: 4

Table 7 - Continued

Northwest Branch				
Carroll Apartments	1002 Quebec Terrace #102, Silver Spring MD 20903	Equity Management		
Forest Park Apartments	9316 Piney Branch Rd. #106, Silver Spring MD 20903	CIH Properties		
Hampshire West Apartments	1432 Hampshire West Ct., Silver Spring MD 20903	Southern Management Corp.	✓	
Nob Hill Apartments	9120 Piney Branch Rd., Silver Spring MD 20903	Southern Management Corp.		
Northwest Park Apartments	475 Southampton Dr., Silver Spring MD 20903	Kay Management Co., Inc.	✓	
Oak Ridge Apartments	1028 Quebec Terrace #T4, Silver Spring MD 20903	Augusta Properties	✓	
Park Montgomery Apartments	8860 Piney Branch Rd., Silver Spring Md 20903	Edgewood Management Corp.		
University Gardens	440 University Blvd. East, Silver Spring MD 20901	NCBA Housing Mgmt. Corps.		
University Manor	820 University Blvd. East, Silver Spring MD 20903	Equity Management	✓	
Total Contacted:			9	Total Completed: 4

Paint Branch				
Enclave Silver Spring	11225 Oak Leaf Drive, Silver Spring MD 20901	Berkshire Property Advisors	✓	
Montgomery Paint Branch	11542 February Circle Suite 104, Silver Spring MD 20904	Grady Management	✓	
Montgomery White Oak	11550 Stewart Lane #109, Silver Spring MD 20904	Grady Management	✓	
Oak Hill Apartments	11497 Columbia Pike, Silver Spring MD 20904	Commodore Management Co. Inc.	✓	
Snowden's Ridge Apartments	2105 Harlequin Terrace, Silver Spring MD 20904	Grady Management	✓	
Spring Parc Apartments	11 Featherwood Court, Silver Spring MD 20904	ROSS Management Services	✓	
Vista at White Oak	11430 Lockwood Drive #104, Silver Spring MD 20904	Grady Management	✓	
White Oak Gardens	11600 Lockwood Drive, Silver Spring MD 20904	Case Management	✓	
White Oak Park	11431 Lockwood Drive, Silver Spring MD 20904	The Donaldson Group		
White Oak Towers	11700 Old Columbia Pike, Silver Spring MD 20904	Kay Apartments	✓	
Woodleaf Apartments	1512 Heather Hollow Cir. #14, Silver Spring MD 20904	Home Properties	✓	
Yorkshire Apartments	11401 July Drive Suite 204, Silver Spring MD 20904	Grady Management	✓	
Total Contacted:			12	Total Completed: 4

Table 7 - Continued

Little Paint Branch				
Ashford At Woodlake	14175 Castle Blvd., Silver Spring MD 20904	The Donaldson Group		
Aston Woods Apartments	3411 Gateshead Manor Way, Silver Spring MD 20904	Waterton Residential		
Aventine Silver Spring Apartments	13615 Colgate Way, Silver Spring MD 20904	Greystar		
Dring's Reach Apartments	3407 Robey Terrace #102, Silver Spring MD 20904	Equity Management		
Hampton Hollow Apartments	3408 Hampton Hollow Dr., Silver Spring MD 20904	Fairfield Residential		
Hampton Point Apartments	3340 Hampton Point Dr., Silver Spring MD 20904	Associated Estates Realty Corps.	✓	
Knights Bridge I Apartments	3310 Tea Garden Cir. Suite 202, Silver Spring MD 20904	Grady Management	✓	
Montclair Apartments	3525 Sheffield Manor Terrace, Silver Spring MD 20904	LCOR, Inc.	✓	
Waterford Tower	1400 Castle Blvd., Silver Spring MD 20904	ROSS Management Services		
Windsor Court & Tower Apartments	13802 Castle Blvd., Silver Spring MD 20904	Zuckerman Gravely Mgmt., Inc.		
Woodlake Apartments	14175 Castle Blvd., Silver Spring MD 20904	The Donaldson Group		
Woodvale Apartments	13831 Castle Blvd., Silver Spring 20904	The Donaldson Group	✓	
Total Contacted:			12	Total Completed: 4

Table 8. Commercial Properties Contacted and Surveys Completed

Commercial Property Name	Address	Management Co.	Survey Completed
City Place Mall	8661 Colesville Rd., Silver Spring MD	Petrie Ross Ventures	
Arliss Shopping Center	8750 Arliss St., Silver Spring MD	Washington Real Estate Investment Trust	
Woodmoor Shopping Center	10115 Colesville Rd., Silver Spring Md	Regency Centers	
Westfield Wheaton*	11160 Veirs Mill Rd., Wheaton-Glenmont, MD	Westfield Shoppingtown Wheaton	
Triangle Lane	11244 Triangle lane, Wheaton MD	Community Realty Co.	
Wheaton Park Shopping Center	12015 Georgia Ave., Silver Spring MD	Washington Real Estate Investment Trust	
Kemp Mill Shopping Center	1372 Lambertton Drive, Silver Spring MD (approx.)	Commercial Managenet Co.	
White Oak Shopping Center	11200 New Hampshire Ave., Silver Spring MD	Saul Centers	✓
Orchard Center	12000 Cherry Hill Rd., Silver Spring MD	Unconfirmed	
Briggs Chaney Marketplace	13807 Outlet Dr., Silver Spring MD	Saul Centers	✓
Cloverly Village Shopping Center	15521 New Hampshire Ave., Silver Spring MD	Collier's International	✓
Briggs Chaney Plaza	13820 Old Columbia Pike, Silver Spring MD	Collier's International	✓
Plaza Del Mercado	2200 Bel Pre Rd., Silver Spring MD	Federal Realty Investment Trust	
Hillandale Shopping Center	10169 New Hampshire Ave., Silver Spring MD	Duffie Inc.	
Westech Village Corner	Prosperity Dr. & Tech Rd., Silver Spring MD	JBG Retail	
Shoppes of Burnt Mills	10740 Colesville Rd., Silver Spring MD	Regency Centers	

Table 9. Highlights from Completed Apartment Surveys (23 Total Responses)

Question 5. How would you rate your property's litter problem?	100% of respondents chose <i>No litter problem, Small, but manageable, or Noticeable</i> . Most chose <i>Small, but manageable</i> with 64%. (Other options were <i>Serious</i> and <i>Very serious</i> .)
Question 6. Where are your litter problem areas? (Please select all that apply)	79% of respondents selected <i>At the dumpsters</i> . The next three highest responses: <ul style="list-style-type: none"> • <i>At the recycling containers</i> (47%), • <i>Parking lots/garages</i> 37%, and • <i>Sidewalks</i> (37%).
Question 13. Have you contacted your residents about the litter problem?	84% of respondents answered <i>Yes</i> .
Question 14. How have you contacted your residents about the litter problem?(Please select all that apply)	81% of respondents answered <i>Written notices to each apartment unit</i> . The next two highest responses: <ul style="list-style-type: none"> • <i>Verbal</i> (56%) and • <i>Newsletters</i> (50%) Note: from questions 15 and 16, 43% and 50% replied notices and signs, respectively, were multilingual.
Question 23. Do you think the Montgomery County plastic bag fee has helped reduce plastic bag litter on your property?	Six of 19 respondents (32%) responded <i>Yes</i> . Only 2 (11%) responded <i>No</i> . Remaining respondents were unsure. (4 respondents skipped this question.)
Question 24. What suggestions or recommendations would you give a new property manager regarding litter control issues.	61% of respondents referenced communicating with residents in their recommendations.

Table 10. Highlights from Completed Commercial Property Surveys (5 Total Responses)

Question 5. How would you rate your property's litter problem?	50% of respondents chose <i>Small, but manageable</i> and 50% chose <i>Noticeable</i> . (One respondent skipped this question)
Question 6. Where are your litter problem areas? (Please select all that apply)	80% of respondents selected <i>At the dumpsters</i> and <i>At the recycling containers</i> . The next five highest responses: <ul style="list-style-type: none"> • <i>Street curbs</i> (60%) • <i>Sidewalks</i> (60%) • <i>Public trash containers</i> (40%) • <i>Parking lots and garages</i> (40%), and • <i>Near buildings</i> (40%).
Question 15. Do you (or contracted company) use a vacuum sweeper to clean the parking lot(s)?	100% of respondents answered <i>Yes</i> .
Question 17. Have you contacted your tenants about the litter problem?	Four out of 5 respondents (80%) answered <i>No</i> .
Question 19. Have you posted signs throughout your property to discourage littering?	100% of respondents answered <i>No</i> (one respondent skipped this question).
Question 21. Do you have a problem with illegal dumping?	Four out of 5 respondents (80%) answered <i>Yes</i> .
Question 22. Do you have any signage specifically to discourage illegal dumping?	Three out of 5 respondents (60%) answered <i>No</i> .
Question 29. Do you think the Montgomery County plastic bag fee is helping to reduce plastic bag littering on your property?	Four out of 5 respondents (80%) answered <i>Not Sure</i> . One respondent answered <i>No</i> .

Task 4: Lower Rock Creek Tributaries Trash Surveying

Under this sub-task, COG combined the MDE-approved Anacostia tributary trash surveying field check list (i.e., 20 trash categories) with COG's 1998 "Trash Surveying Methodology and Indexing System" to survey approximately 10 total tributary miles in Lower Rock Creek (downstream of Norbeck Road/MD Route 28) (Figure 11). The purpose of this monitoring effort was to provide MCDEP with a snapshot of relative trash levels and to provide general guidance for ranking candidate sites for future potential installation of trash catching devices. Of primary interest was the identification of road crossing sites suitable for the installation of a 'Bandalong' or similar trash trapping system. It should be noted that this system was recently employed by the District of Columbia to reduce the quantity of 'floatables' contributed by the Watts Branch tributary. Twenty two (22) road/tributary crossing areas were surveyed. At each site, COG surveyed approximately 0.5 miles of stream (i.e., 0.25 miles upstream of the road crossing and 0.25 miles below). The total number of trash items were recorded, enumerated on a 100 foot basis and catalogued according to the 20 general types employed as part of the Anacostia trash TMDL baseline monitoring effort (Table 5). Site specific trash levels were also categorized based on the number of trash items observed per 100 feet of stream surveyed and converted into GIS/Geodatabase product. The COG system ranks trash levels as follows:

Trash Index	
Verbal Ranking	No. Items/100 ft.
None - Very Light	0 - 10.0
Light	10.1 - 25.0
Moderate	25.1 - 50.0
High	50.1 - 100.0

Importantly, this subtask was performed and completed within the first three quarters of Year one. Included is an informative 20-25 page technical memorandum that summarizes tributary survey results, as well as recommended locations for the installation of potential trash reduction systems (Appendix 4).

Summary of Findings

COG completed 22 candidate site evaluations including 10.3 miles (total) of associated stream trash surveying. For each of the 22 sites (Figure 11), site condition concept sketches and photographic documentation were generated.

The top five highest ranked candidate sites (Table 11) are:

1. Upper Turkey Branch at Georgia Avenue (UTUB-2, 89 pts);
2. Lower Turkey Branch at Veirs Mill Road (LTUB-1, 87 pts);
3. Upper Turkey Branch at Connecticut Avenue, Matthew Henson Park (UTUB-3, 86 pts);
4. Coquelin Run at Jones Mill Road (COQR-1, 85 pts); and
5. Kensington Heights Branch at Everett Street (KEHB-1, 81 pts).

Figure 11. Rock Creek Bandalong and Trash Survey Locations

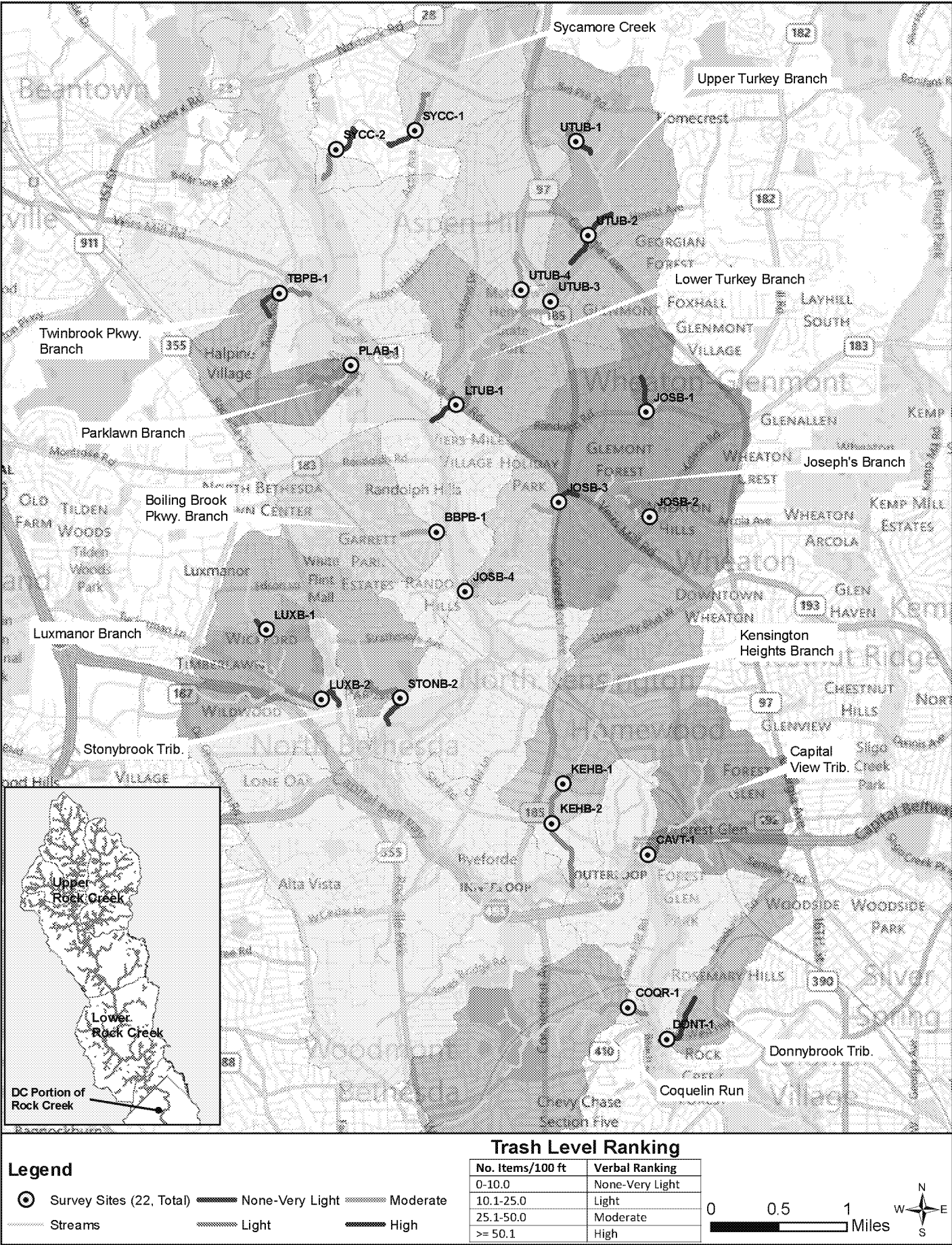


Table 11. Summary: Rock Creek 'Bandalong' Candidate Site Prioritization Scores

Site ID	Subwatershed	Road Crossing	Priority Category Score ^{1/}						Total Score	Upstream D.A. (acres)	General Level of Upstream SWM Control (%)	Verbal Priority Level
			1	2	3	4	5	6				
SYCC-1	Sycamore Creek	Bauer Drive	5	18	20	10	8	5	66	494.4	2.0	Medium
SYCC-2	Sycamore Creek	Russett Road	10	12	10	6	12	3	53	921.2	1.1	Low
TBPB-1	Twinbrook Pkwy Branch	Twinbrook Pkwy	10	12	12	10	10	6	60	222.9	12.0	Medium
PLAB-1	Parklawn Branch	Parklawn Road	10	8	10	2	10	1	41	200.6	6.7	Low
UTUB-1	Upper Turkey Branch	Connecticut Avenue (Gate of Heaven Cemetery)	20	10	13	8	12	3	66	247.5	35.9	Medium
UTUB-2	Upper Turkey Branch	Georgia Avenue	20	16	22	13	15	3	89	727.8	32.6	High
UTUB-3	Upper Turkey Branch	Connecticut Avenue (Mathew Henson Park)	15	16	22	15	13	5	86	1,127.5	21.8	High
UTUB-4	Upper Turkey Branch	Elizabeth Street	15	11	15	8	5	3	57	1,690.1	10.5	Low
LTUB-1	Lower Turkey Branch	Veirs Mill Road	15	18	23	15	11	5	87	645.1	1.1	High
BBPB-1	Boiling Brook Pkwy. Trib.	Rocking Horse Road	15	14	18	9	5	5	66	573.1	18.6	Medium
JOSB-1	Joseph's Branch	Randolph Road	15	8	20	8	10	2	63	210.8	2.1	Medium
JOSB-2	Joseph's Branch	King Tree Street	10	20	20	13	10	5	78	175.6	0.2	Medium
JOSB-3	Joseph's Branch	Connecticut Avenue	15	10	10	14	5	2	56	1,473.2	0.9	Low
JOSB-4	Joseph's Branch	Jones Mill Road (at Forsythe Avenue)	15	20	25	3	4	2	69	1,779.6	0.9	Medium
STONB-2	Stonybrook Trib.	Montrose Avenue	10	12	12	10	10	6	60	413.9	23.3	Medium
LUXB-1	Luxmanor Branch	Sugarbush Lane	10	18	25	3	12	3	71	168.6	98.1	Medium
LUXB-2	Luxmanor Branch	Grosvenor Place	5	15	20	15	10	3	68	583.3	64.7	Medium
KEHB-1	Kensington Heights Branch	Everett Street	10	12	25	15	15	4	81	891.4	11.8	Medium
KEHB-2	Kensington Heights Branch	Saul Road	10	10	25	3	13	5	66	1,013.4	11.4	Medium
CAVT-1	Capitol View Branch	Stonybrook Drive	10	18	20	15	10	4	77	657.1	3.2	Medium
COQR-1	Coquelin Run	Jones Mill Road	15	18	23	15	9	5	85	1,078.5	6.9	High
DONT-1	Donnybrook Trib.	Meadowbrook Lane	10	19	23	13	10	5	80	274.0	5.3	Medium

^{1/} Priority Category Score Description:

1. General stream trash level (i.e., no. of items/100 feet) and rough percentage of the floatable trash load component (if loads are high, 20 points);
2. Overall site accessibility (i.e., for both ease of installation and maintenance - if access is excellent, 20 points);
3. Presence/absence of both concrete wing walls for firmly securing the 'Bandalong' "rider poles" and a nearby downstream pool of sufficient width, length and depth (i.e., to help dampen higher stormflow velocities and to keep the Bandalong skirt and pontoon system floating at all times - if both wing walls and good pool present, 25 points);
4. High stream velocities (i.e., > 8-10 fps) and/or transport of large woody debris (if no anticipated problem(s), 15 Points);
5. Presence of overhead power lines (and/or larger trees requiring removal) which could possibly interfere with basket removal/maintenance-related operations by a boom truck (if no anticipated problem, 15 points); and
6. Site visibility/environmental education value potential (e.g., adjacent to heavily used Hiker-Biker trail) (high visibility/value, 5 points)

Recommendations:

Annual Stream-Level Trash Surveying:

MCDEP should consider continuing the MDE-approved Anacostia Tributary trash surveying protocol at the fifteen 500 foot long existing stream trash survey sites through 2016. This would provide long-term trend stream trash condition data. It will also provide the relative level of plastic bags, over multiple-years, observed in the stream so as to provide insight into the efficacy of the 2012 carryout bag law.

MCDEP should consider continuing to survey the existing five 250 foot long sites to provide the long-term trend accumulation rates. This would generate long-term trash accumulation rates as it may relate to the following: local rainfall data, land use, upstream imperviousness, trash reduction activities and other.

Annual Land-based Trash Surveying:

Due to the survey challenges and driver and counter safety issues, COG does not recommend that the driving portion of the protocol be performed through a citizen volunteer program. In addition, these driving surveys should be resurveyed for County roads, on a 5-year interval focusing on roads located in medium to high density, commercial/business and industrial land use areas. Roads that have an active Adopt-A-Road program should be determined and may be considered a low priority for surveying.

As part of the 5-year interval land-based trash surveys, continue to monitor for potential illegal trash dumping 'hot spots' by utilizing GIS mapping. Potential 'hot spots' can be determined by overlaying current imagery with road and property boundary data layer to target roads that dead-end onto public park property, run adjacent to the CSX railroad right-of-way, or are located rear loading areas of industrial/commercial areas, etc.

Trash reduction-related efforts by apartments and commercial management firms:

Sending out regular mail and email invitations to the survey is unlikely to solicit many responses, so it is recommended that in-person visits are the best way to solicit participation.

For all in-person visits to commercial and apartment property managers, have at least one County representative present. This helps lend legitimacy to survey requests. Particularly with commercial property managers, make appointments prior to in-person visits or phone calls. It is recommended that staff should ideally be wearing appropriate agency/organization attire or "business professional" attire, as these firms mostly adhere to that type of professional atmosphere. Formal thank you notes should be sent to both commercial and apartment respondents.

As several comments in the apartment property surveys indicated that trash-related problems on their properties is coming from nearby commercial shopping centers (i.e., shopping carts, bags with business names/logos on them, etc.), additional surveys should target the apartments within walking distance of shopping centers.

Conduct the apartment and commercial property survey again in 3-5 years to gauge general litter conditions, litter reduction efforts, and changes in public/property managers perception towards the Montgomery County carryout bag tax.

Lower Rock Creek Tributaries Trash Surveying:

MCDEP should consider an additional trash and litter trap survey to evaluate the feasibility for a trash trap catching device that does not require culvert/bridge installation. DDOE recently installed a second Bandalong trash trap using cement anchors buried in the streambank. This trap was placed in Watts Branch where the drainage area is approximately two square miles. The trap has been in place since early 2012 and continues to remove floatable trash with regular maintenance/clean outs. MCDEP should consider an additional Rock Creek tributary survey to select candidate sites to deploy a trash trap catching device that does not require culvert/bridge installation.

References

MDE (Maryland Department of the Environment) and DDOE (District of Columbia, Department of Environment). 2010. Total Maximum Daily Loads of Trash for the Anacostia River Watershed, Montgomery and Prince George's Counties, Maryland and The District of Columbia - Draft. Submitted to EPA (U.S. Environmental Protection Agency). Baltimore, MD.

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